TECHNOLOGY DEPT

JULY 15, 1957

61-14

Telephone Engineer

AND MANAGEMENT

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THE NATIONAL TELEPHONE MAGAZINE

FEATURING IN THIS ISSUE

- ★ PLANT ENGINEERING, CONSTRUCTION & MAINTENANCE, *by W. M. Driggs*
- ★ A CURE FOR PLANT PERSONNEL PROBLEMS, *by T. DeWitt Talmage*
- ★ MICROFILMING SAVES US $4000 PER YEAR, *by Robert D. Bonnar*
- ★ INDUSTRY NEWSLETTER ★ EDITORIAL ★ NEW PRODUCTS SHOWCASE

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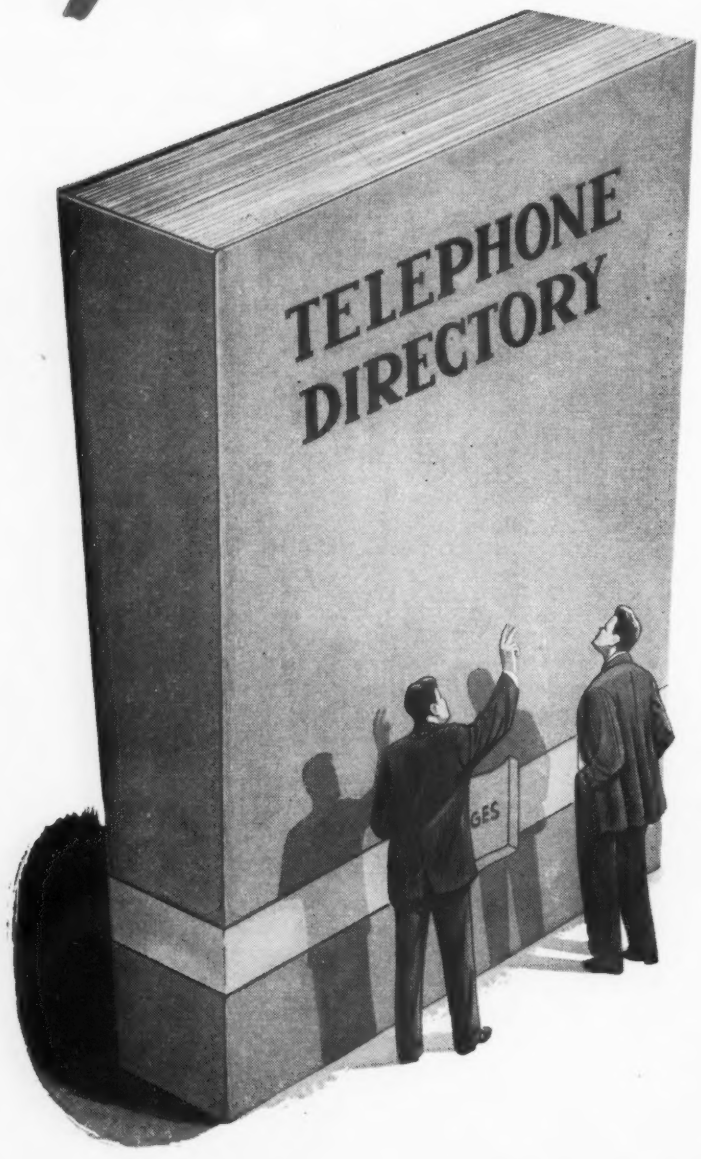

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NEW, SHORT *Koiled Kords**

CUT HANDSET LOSSES . . . on Coin Collector Telephones

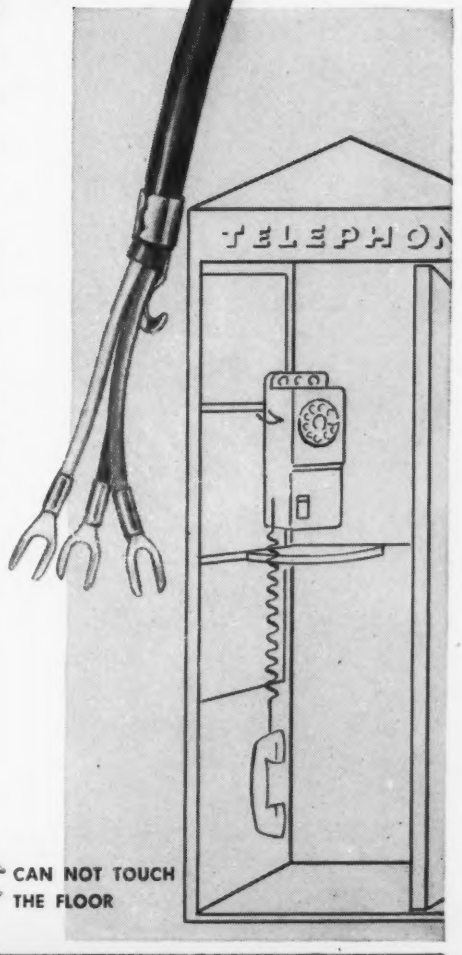
KOILED KORD ILLUSTRATED IS ACTUAL SIZE

These new short KOILED KORDS retractile cords allow sufficient length for use in telephone booths but are short enough to prevent the handset from hitting the floor if dropped.

Figure your past losses from broken handsets and you'll see how much these new short KOILED KORDS can save you.

These new short KOILED KORDS are available for Automatic Electric, Stromberg-Carlson and Western Electric handsets.

KOILED KORDS, the original retractile cords, are the result of 17 years of research, development and use.



CAN NOT TOUCH THE FLOOR

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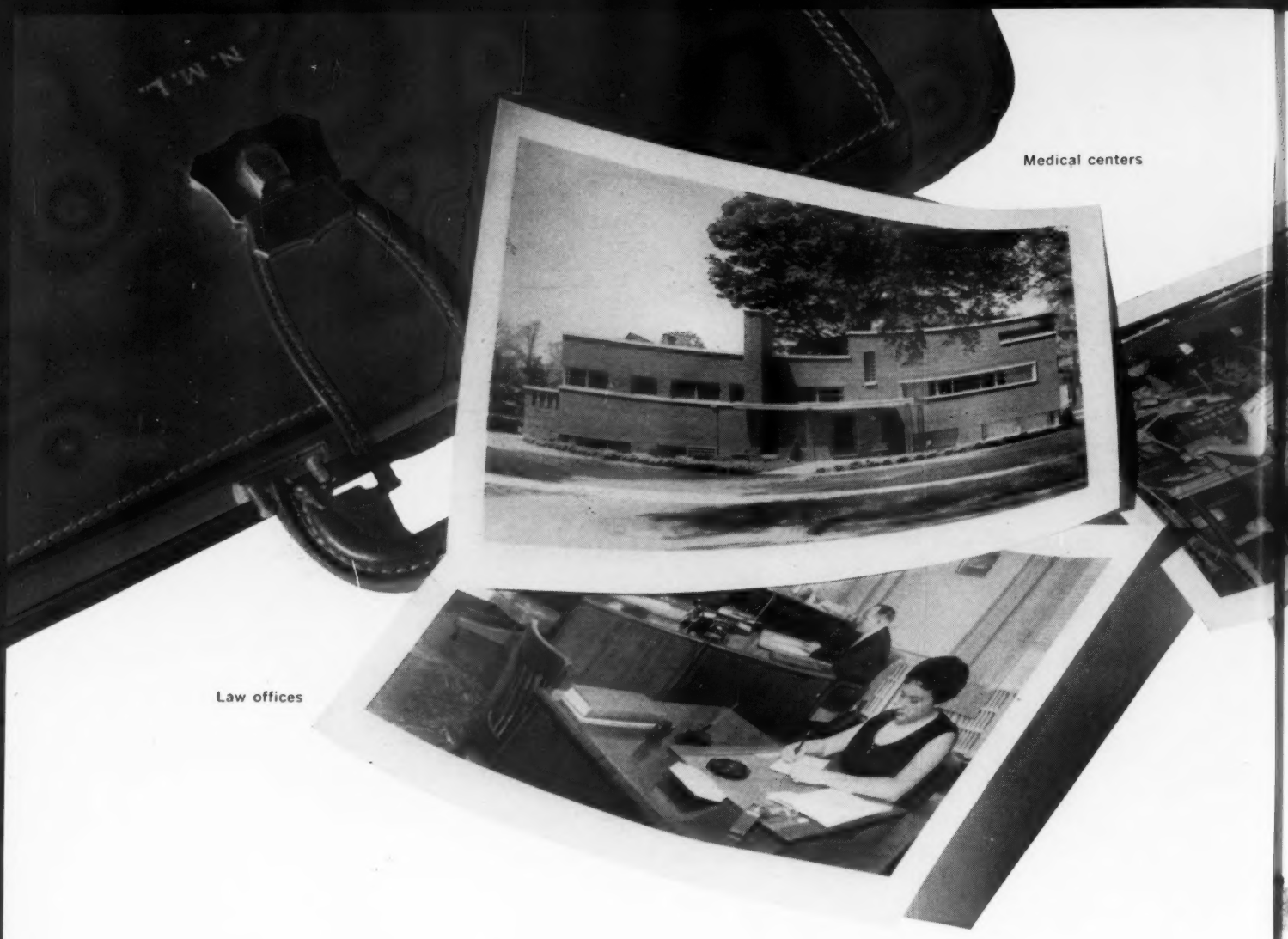


how to sell the "in-between" market...

YOU can give your commercial revenue a substantial boost by selling your medium-sized commercial subscribers a 2-10 or 4-20 Dial PBX System.

You'll find your best market for these unattended systems among your "in-between"customers—*those who are outgrowing their present equipment, but do not need a large system.*

You can provide these subscribers with "unrestricted" stations by supplying the new Stromberg-Carlson "1573-A" 2-line instruments with the 2-10 and 4-20 cabinets. Or you can provide fast, efficient dial PX service by furnishing our standard "1543" telephones.

The 2-10 System provides 2 simultaneous talking paths, 10 lines, and a maximum of 30 stations, including extensions. The 4-20 System offers 4 simultaneous talking paths, 20 lines, and a maximum of 60 stations, counting extensions.

To get complete technical details and all the selling aids you need, call or write the Stromberg-Carlson sales office in your area.

STROMBERG-CARLSON

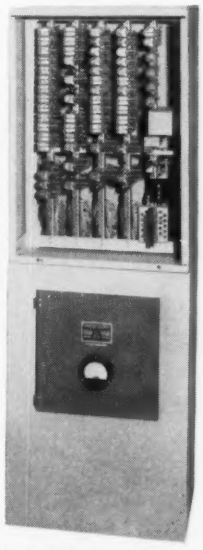
A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

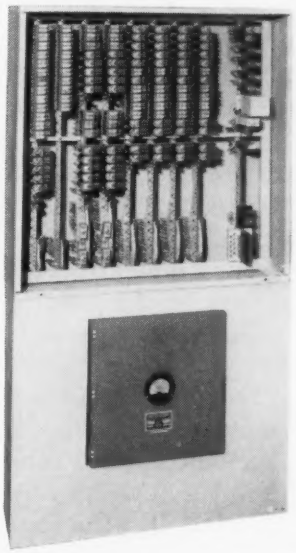
HERE ARE YOUR CUSTOMERS

Small factories, warehouses and other industrial establishments. Large law offices or groups of attorneys who can share facilities. Medical centers where a number of physicians can use one system. Banks or bank branch offices with up to 60 employees. Insurance offices, particularly regional headquarters.

THIS IS THE EQUIPMENT



2-10 SYSTEM provides selective talking, automatic ringing, instantaneous ringing trip, and dial, ringing and busy tones. Equipment cabinet, including battery eliminator, is 53½" high, 18¼" wide, 10⅛" deep. Capacity is 2 simultaneous talking paths, 10 lines, up to 30 stations, including extensions.

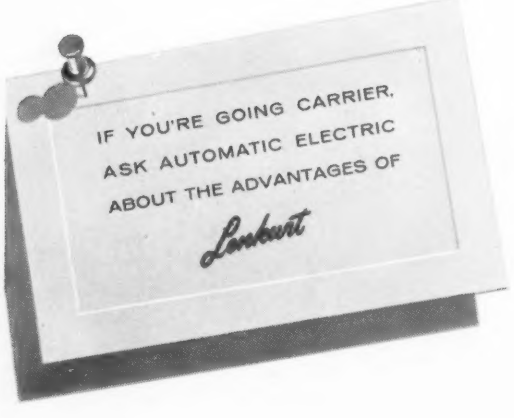


4-20 SYSTEM offers the same basic features as the 2-10. Equipment cabinet, including battery eliminator, is 59" high, 32" wide, 10⅛" deep. Capacity is 4 simultaneous talking paths, 20 lines, up to 60 stations, including extensions.

"RESTRICTED" STATIONS (non-trunk-connected) use the popular Stromberg-Carlson "1543" instruments to provide fast, efficient dial PX service. (Choice of eight modern colors.)

"UNRESTRICTED" STATIONS are equipped with new Stromberg-Carlson "1573-A" 2-line telephones (available in gray or ebony), giving access both to trunk lines and internal dial system. Hold button for each trunk.

TELEMETERING . . .



Leasing circuits for TELEMETERING . . . one of the fast-growing new opportunities for you to get extra revenue. All over the United States, more and more circuits are being leased from operating telephone companies for the transmission of metered data (temperature, pressure, flow, etc.) to distant control points. *Who's in the market?* Pipelines, power companies, refineries, chemical processors, steel manufacturers, many others. *How can you add channels economically to tap new sources of revenue like this?* With Lenkurt Carrier, of course. Automatic Electric provides Lenkurt equipment in a complete, easy-to-own package—engineered, furnished and installed. Our engineers would be glad to help you; just drop us a line today. Automatic Electric Sales Corporation, Northlake, Illinois.

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AUTOMATIC ELECTRIC

A member of the General Telephone System—
One of America's great communications systems

GENERAL TELEPHONE SYSTEM

Plant Engineering 39

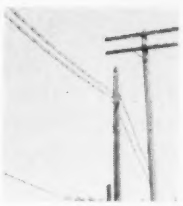
We'll agree that planning today's plant for tomorrow's service demands does present certain obstacles — things which cannot be foreseen and things which may or may not happen. But, as Bill Driggs points out in this helpful article, "despite the obstacles, long-range planning should be a 'must' in your operations . . ."

Personnel Problems 44

The experts estimate that the 1967 labor force will be adequate numerically. However, there is some concern whether the individuals in our labor force will be qualified to perform the various grades of work which will be required. Quality not quantity is the principal matter in question.

Microfilm Bookkeeping 52

Faced with an ever-increasing problem of internal bookkeeping the Ashtabula (Ohio) Telephone Co. installed a microfilming system for toll-ticket billing. In this article Commercial Manager Robert D. Bonnar reports that the system has proved in as a good-will builder and has produced substantial savings.



New Products 81

This month our New Products' Editor brings you information on — (1) new belt suspenders that will keep safety belts in proper position; (2) a new line-construction body; (3) a new, self-threading lock nut; (4) a new, varnished, polyester tape; and (5) an impedance bridge assembly.

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Telephone Engineer

AND MANAGEMENT

THE NATIONAL TELEPHONE MAGAZINE

Vol. 61 No. 14 JULY 15, 1957

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FRONT COVER

OFFICIALS OF CIRCLEVILLE and the Ohio Consolidated Telephone Co. broke ground for a new $110,000 building at Court and Pinckney Sts. recently. The new building is part of a million dollar expansion program. Front row, from left: MAYOR ROBERT HEDGES; CLARE E. WILLIAMS, Marion, pres., Ohio Consolidated Telephone Co.; D. E. McDONALD, President of the Circleville Chamber of Commerce, and RICHARD H. RAWLINGS, operating vice president of Ohio Consolidated, Marion. In the back row, from left, are CHARLES BOWEN, Marion, division manager for the telephone company; CHARLES OBORN, architect, and WILLIAM PRUDHOE, project foreman for W. L. CARSTENSEN, contractor.

Volume 61, No. 14. Published on the 1st and 15th of each month by TELEPHONE ENGINEER PUBLISHING CORP. Office of Publication, Rochelle, Ill. Executive and Editorial Office, 7720 Sheridan Road, Chicago 26, Ill. Telephone — Rogers Park 4-3040. Subscriptions: U. S. and Possessions, $4.00 per year; Canada $4.50; in all other countries, $6.50. Single copies, U.S.A., 50 cents. Entered as Second Class matter at the post office at Rochelle, Ill. under the act of March 3, 1879.

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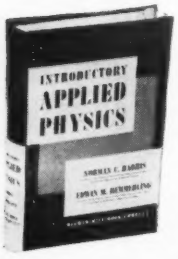
made plain with on-the-job explanations for technicians



Look forward to a better future as a technician — in industry, research, or armed forces — with the increased understanding of physics this book gives you. It clearly explains the principles of applied physics, and their everyday application in industries today.

Introductory

APPLIED PHYSICS

By NORMAN C. HARRIS
Instructor in Physics and Engineering
and EDWIN M. HEMMERLING
Instructor in Engineering Mathematics
Bakersfield College

729 pages, 6 x 9, illustrated, $6.75

THE understanding of physics needed by technical workers is provided by this easy-to-follow treatment. It treats situations which arise on the job for technicians — particularly in electronics, generators and motors, electric power, refrigeration, air conditioning, and electrical communications, and other industrial fields. The book covers mechanics, heat, sound, light, magnetism, and electricity — and provides an introduction to atomic physics. Photographs and technical data from scores of industrial firms are included.

Makes plain up-to-date applications of

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COMING CONVENTIONS

ALASKA Independent Telephone Association, Elks Lodge, Kodiak, Aug. 26-28.

TENNESSEE Telephone Association, Hermitage Hotel, Nashville, Sept. 12-13.

ARKANSAS Telephone Association, Arlington Hotel, Hot Springs, Sept. 16-17.

MICHIGAN Independent Telephone Association, Hotel Pantlind, Grand Rapids, Sept. 17-19.

ROCKY MOUNTAIN Telephone Association, Hotel Utah, Salt Lake City, Sept. 18-20.

WEST VIRGINIA Independent Telephone Assn., Blackwater Lodge, Davis, Sept. 30-Oct. 1.

NORTH CAROLINA Independent Telephone Association, Carolina Hotel, Pinehurst, Oct. 3-4.

UNITED STATES Independent Telephone Association, Conrad Hilton Hotel, Chicago, Oct. 14-16.

VIRGINIA Independent Telephone Association, Roanoke Hotel, Roanoke, Oct. 24-25.

SOUTH CAROLINA Independent Telephone Association, Clemson House, Clemson, Nov. 4-5.

ALABAMA-MISSISSIPPI Telephone Association, Thomas Jefferson Hotel, Birmingham, Nov. 11-12.

GEORGIA Telephone Association, Radium Springs Hotel, Albany, Nov. 13-14.

OKLAHOMA Telephone Association, Huckins Hotel, Oklahoma City, Nov. 21-22.

FLORDIA Telephone Association, The Balmoral, Bal Harbour, Miami Beach. Dec. 2-3.

LOUISIANA Telephone Association, Jung Hotel, New Orleans, Feb. 12-13, 1958.

MINNESOTA Telephone Association, St. Paul Hotel, St. Paul, Feb. 17-19, 1958.

TEXAS Telephone Association, Baker Hotel, Dallas, March 3-4, 1958.

KENTUCKY Telephone Association, Phoenix Hotel, Lexington, March 4, 1958.

IOWA Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 8-9, 1958.

NEBRASKA Telephone Association, (Hotel not announced), Omaha, April 22-23, 1958.

WISCONSIN State Telephone Association, Hotel and location to be announced. May 14-15, 1958.

ILLINOIS Telephone Association, Hotel Pere Marquette, Peoria, May 21-22, 1958.

PENNSYLVANIA Independent Telephone Association, Bedford Springs Hotel, Bedford, May 26-28, 1958.

NEW YORK Telephone Association, Scaroon Manor, Schroon Lake, June 16-18, 1958.

REX

TELEPHONE WIRE & CABLE for all needs...

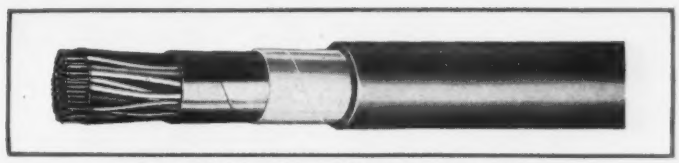
Aerial and Duct are R. E. A. listed. Both Aerial and Duct and Direct Burial Cable utilize polyethylene insulation, aluminum shield and high molecular weight polyethylene jacket for top electrical values. Available in #26, #24, #22, or #19 AWG in 6 through 404 pairs.

Conductors insulated with high molecular weight polyethylene and jacketed with color coded, weather resistant vinyl provide good transmission values at low cost. Available in either #19 or #22 AWG with 3, 6, 11, or 16 pairs cabled over a high molecular weight polyethylene insulated high strength galvanized support wire.

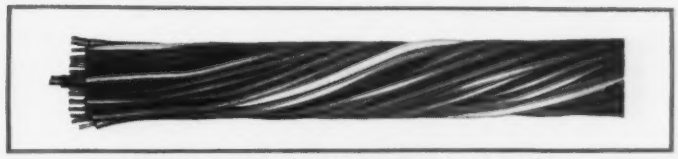
The rugged weather resistant vinyl insulation over the conductors is fully color coded. This construction, designed for block distribution, serves best where low cost rather than low attenuation is the prime consideration. Available in #24 AWG with 6, 11, or 16 pairs.

A high molecular weight, weather resistant polyethylene extrusion encompasses the parallel conductors. A raised ridge tracer provides polarity identification. The high strength conductors make possible long spans on lateral branches or drop runs. Available in #14 or #12 Copperweld or .083 galvanized steel.

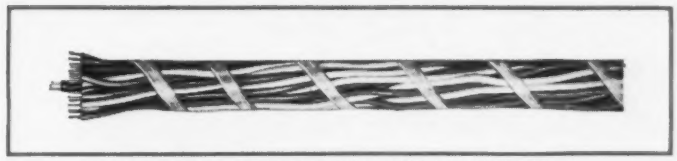
Solid, soft drawn bare copper conductors fully color coded with heat resistant polyvinylchloride insulation. All pairs twisted with varying lays to minimize cross talk and cabled to insure maximum flexibility. A tough, water resistant vinyl jacket in either brown or ivory provides good conductor protection for exposed insulation. Rip cord construction prevents damage to conductors in stripping. Available in #24 AWG with 6, 12, 16, 21, 26, 51 or 76 pairs.



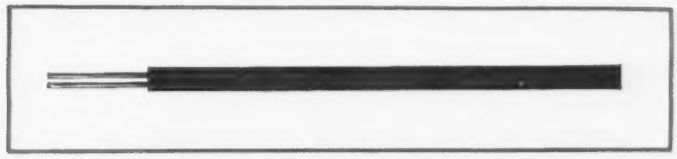
EXCHANGE AREA CABLE



RURAL DISTRIBUTION WIRE

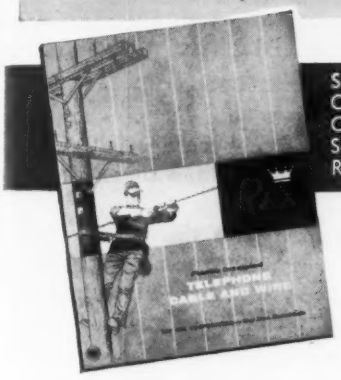


URBAN DISTRIBUTION WIRE



ONE PAIR DISTRIBUTION WIRE

INSIDE WIRING CABLE



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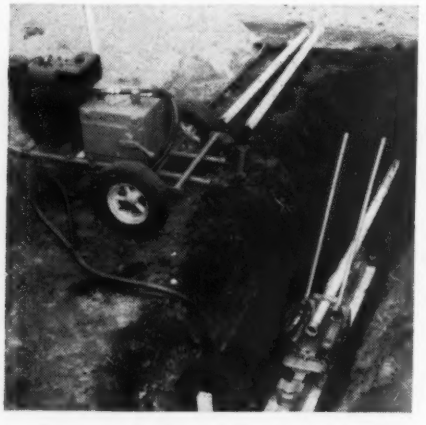

Two feet per minute average pushing time

GREENLEE Pushers are available in two sizes: No. 790 for ¾" to 4" pipe . . . No. 795 for pipe over 4", concrete sewer pipe, large ducts. Average performance of No. 790, shown above with power pump, two feet per minute. Write for literature.

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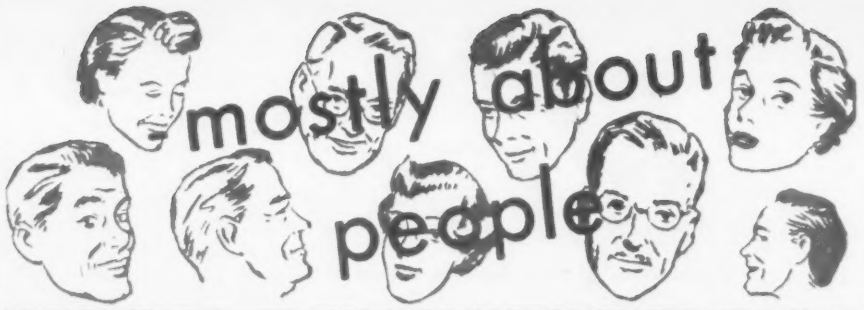

ACROSS THE EDITOR'S DESK

New York Trip

RECENTLY we were in New York on USITA business and while there took the time to drop by the offices of the General Telephone Corporation. We saw many old friends and made several new ones. Too, it was a real pleasure to us to drop by and congratulate personally *Walter G. Wright*, the vice president — Operations, who had just returned early that morning from his old stamping grounds in San Angelo, Texas, where he had attended the marriage of his daughter.

We also enjoyed congratulating *Jack LaMaster*, until May 15 a member of the staff of the General Company of Illinois, who is now in the New York offices as director of commercial operation for the General System. *Fred Norris*, another vice president busy on his new duties took time out to have us as his guest for luncheon in the company's dining room.

Elmer Danner

THE JUNE issue of the *Southwest General News* devoted much of its space to *Walter G. Wright*, its former president (see above), and to its new president *Elmer H. Danner*.

We think the magazine did a nice job on the Danner story. He and his family are old friends of ours and the success he has enjoyed in our old home state of Texas has been outstanding.

The story in the magazine told many details of the Danner family that might be quite surprising to employes of the company he now heads but to many of us in the industry it was more in the way of a list of the good and worthwhile deeds he has accomplished on the national scale.

Mrs. Danner is a lady who unostentatiously does many, many things for her community that sometimes goes unnoticed but the citizens of San Angelo are aware of her former title of First Lady of Sherman, Texas, and are enjoying her civic activities in her new home town very much.

Travelers

ROBERT E. WILLIAMS, Bob to his many friends, and his family are now in Europe for some visiting that he was never able to get time to do while he was an executive of the Gary Group companies . . . *Dan McNulty* of Telephone Repair & Supply, Chicago, showed us part of the beautiful full color photographs he made while visiting the South Pacific with Mrs. McNulty last Spring. We are reproducing one of the photos in black and white in this issue on another page.

People You Know

GLENN GRAWOLS, now of Evanston, Ill. and Deerfield Beach, Fla., will retire from his duties with the General Telephone Corp., the successor company to the new merged Gary properties, on August 1. Glenn was one of the executives of the Gary group and officed for many years at 332 So. Michigan Ave., Chicago. Another former executive of the Gary group, *E. C. Blomeyer*, is now living in the Blomeyer summer home at Lake Geneva, Wisconsin.

George R. Blackburn

WE understand George R. Blackburn, who did business under the name of Blackburn Specialty Co., is now 84 years old and rapidly failing in health.

Mr. Blackburn is the inventor of the station ground clamp now being manufactured by Blaco Manufacturing Co. His residence address is: 2568 Euclid Heights Blvd., Cleveland, Ohio. Why not drop him a line?

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SUPERIOR
DIRECT BURIAL WIRE
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Buy SUPERIOR DIRECT BURIAL WIRE to match the requirements of your installation!

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1 **Need wire having maximum resistance to damage from road or farm machinery and implements . . . or other similar sources?**

Order the SUPERIOR DB No. 217S with spiraled flat steel strip shield and green jacket.

DB 217B

2 **Need wire to resist damage from insects and rodents . . . or peculiar soil conditions which are conducive to increased lightning activity?**

Order SUPERIOR DB No. 217B with longitudinal bronze shield and yellow jacket.

DB 217

3 **Need wire for direct burial installations in areas where conditions are normal and no specific hazards are likely?**

Order SUPERIOR DB No. 217 non-armored type with red jacket.

INDEPENDENT

Order SUPERIOR Direct Burial Wire NOW or write for complete information to

SUPERIOR CABLE

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Now you can gain *all* the advantages of combining cashiering and recordkeeping functions in one location, with the new specially designed REMINGTON RAND® Customer Service Counter. One sectional counter unit accommodates all facilities and records for these operations... for the larger office several units can be joined together in perfect harmony.

Designed to eliminate "standing" cashiering, the counter height permits the clerk to serve from a seated position facing the customer. Facilities for a normal cashiering operation are within arm's reach. As a result customers are served more cordially, promptly and efficiently.

Most important, full time point-of-use fire protection for your vital records is now available in desk-height, certified, insulated counter units. For an estimate on a Customer Service Counter installation tailored to your specific requirements, contact your local Remington Rand representative. For FREE descriptive folder SC764 write today to Room 1761, 315 Fourth Ave., New York 10.

Note the compact, efficient and comfortable working area side of the Customer Service Counters, pictured in the above typical Telephone Company installation. Three units combine protection and convenience for operating records and cash.

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DIVISION OF SPERRY RAND CORPORATION

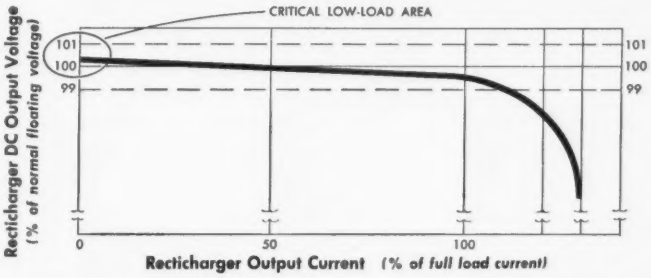
Restful hours for you—

BUT NOT FOR YOUR BATTERIES

Midnight to 6 A.M.—hours that may be stealing *years* from the life of your batteries. During these low-load periods, the output of your battery chargers may crawl up, overcharging batteries, causing gassing, sharply reducing battery life.

Not so—definitely not—with new, vastly improved Raytheon Recticharger® battery chargers. These battery chargers provide constant voltage within ±1% from full load right *down to no load*. They hold the mark even with input voltage variations of ±10%. Result—far less battery maintenance; far greater battery life.

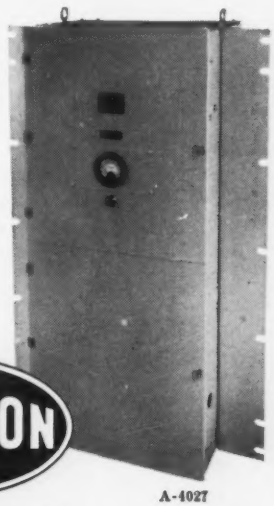
New Rectichargers have a host of other advantages; find out more about them by writing Dept. 6120.



VOLTAGE CURVE IS FLAT from no load to full load with the Recticharger. Note automatic current limiting for overload protection.

NEW 48 VOLT RECTICHARGERS

- No audible hum
- Automatic compensation for rectifier aging
- No moving parts or vacuum tubes
- Models for 3 to 400 amperes



A-4027

RAYTHEON MANUFACTURING COMPANY

Commercial Equipment Division, Waltham 54, Mass.

RAYTHEON

Excellence in Electronics

FILE
the "I gotta go look" type
the "Let's call a conference" type
All kinds of folks need
the "I need both hands" type
the "My arm is asleep" type

Loud-speaking telephones!

Automatic's Loud-Speaking Telephone can be put at a centralized point in a conference group and still not cause feedback, because the microphone is in the base of the telephone. The Type 88 doesn't waste working space either—it's the same size as a regular telephone, and the control unit is separate, for mounting under the desk.

It's surprising how *really* convenient telephoning can be with Automatic's Type 88 Loud-Speaking Telephone. And it's wonderful, too, how many people will say: *"I want one"!* With it, a man can talk and keep both hands free; he can move about and do other work while talking. His voice is picked up from several feet away, by a microphone in the base of the telephone—and he hears the other party over a speaker.

The Type 88 works simply. To answer, you merely press a button; when finished, you need only press another. It has proven invaluable as a conference telephone because many persons can enter into the same conversation.

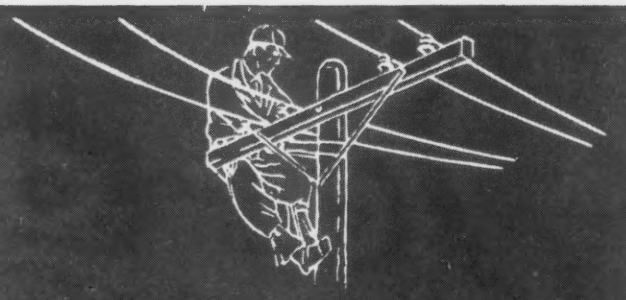
Subscribers are naturally happier, more productive, with Automatic's Loud-Speaking Telephone. And telephone companies are gaining substantial added revenue. If you'd like to learn more about this profit-making telephone, write for Circular 1857. Address: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call FIllmore* 5-7111.

AUTOMATIC ELECTRIC

A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

INDUSTRY NEWSLETTER



Beirne Re-elected CWA President

JOSEPH A. BEIRNE was re-elected to his 10th term as pres. of Communication Workers of America during 11th annual CWA convention in Kansas City last month. Beirne was re-elected by vote of 173,077 to 83,937 for his challenger A. T. Jones who was later defeated by James Massey, when he sought re-election as one of CWA's three v.p.'s. John L. Cruhl & Ray Hackney were re-elected without opposition. Sec.-Treas. W. A. Smallwood was also re-elected.

W. E. Co. Starts Graduate Program

WESTERN ELECTRIC CO. on June 17 launched program of graduate education for its engineers, cost being borne entirely by company. Program is equivalent in cost & administrative effort to establishing a new engineering school of 1000 full-time students, Vice Pres. Engineering Timothy E. Shea stated.

Educational activities are being conducted on college campuses and in three specially equipped centers in New York, Chicago, & Winston-Salem, N. C. Each of the centers include laboratories, libraries, study halls, classrooms, & related facilities. When in full operation, program will involve staff of about 65 full-time Western Electric instructors & administrative people, & about equal number of instructors recruited on part-time basis.

Independents Plan New Mobile System

ACTIVITY of Independent telephone industry in domestic public land mobile field increased. Last month Federal Communications Commission (FCC) received application from Northern Tel. Assoc., Shelby, Mont. for new, 10-unit radiotelephone system, & approved new 125-unit mobile radiotelephone system planned by General Tel. Co. of S. W., San Angelo, Texas, & 25 unit system of Monroeville (Ala.) Tel. Co.

Air Conditioned Cables

LAST MONTH Southwestern Bell Tel. Co. announced plans to "air condition" nearly 5600 miles of main local cables. Expecting to invest $1,500,000 in new development, S. W. Bell said air conditioning plan will protect cables from moisture damage and thereby reduce service failures due to moisture in underground plant by about 90%. New apparatus, called a compressor-dehydrator, pumps dry air into cable at continuous pressure of 7 to 10 lbs. per square inch.

Rate Adjustments

MINNESOTA Railroad & Warehouse Commission prescribed new rates and charges for Turtle River (Minn.) Tel. Co. Multi-party service rates go from $21.80 annually to $36.00; service station switching from $20.90 to $26.90. Original cost of property for rate-making purposes is $9,000. New rates will produce 5.7% return . . . Ohio Commission completed its engineering and accounting investigation of Lykens (Ohio) Telephone Co., application for rate adjustment. Adjusted reproduction cost new valuation amounted to $56,293.93 to which was applied depreciation in amount of $20,465.37, which allowed for present value and rate base of $35,828.26. Accounting report of Commission shows that anticipated revenues will yield return of $2073.51 or a 4.79% rate of return.

Georgia Public Service Commission approved application of Comer Tel. Co., for authority to establish increased rates for exchange telephone service at the Colbert, Comer, Danielsville, Ila, and Lexington exchanges effective upon the installation of Free Extended Area Service between these exchanges and the Athens, Ga., exchange of Southern Bell Tel. & Tel. Co.

Financial

MICHIGAN Public Service Commission approved $57,400 loan to Stanwood (Mich.) Tel. Co., owned by Mr. and Mrs. Donald Kain, for construction of new lines and equipment for new dial office. Tentative date of cutover to dial service is June, 1958 . . . Georgia Public Service Commission approved: (1) Application of Wilkes Telephone & Elec. Co., for authority to borrow additional $107,000 from Rural Electrification Administration for the purpose of rehabilitating and converting Washington, Ga. exchange to automatic dial . . . (2) application of Blakely Tel. Corp., for authority to borrow principal amount of $12,500 at interest rate of 5% per annum.

New Owners

WILLIAM L. HEUER, Stickney, S. D., purchased Alpena (S. D.) Tel. Co. . . . W. C. Caldwell,

Reflective emblem and number on service car.

Reflective bumper emblem on employee's car.

Public Relations in Action

How "Scotchlite" Works for Public Utilities

REFLECTIVE SHEETING

Public service companies recognize that the need for safety and effective community relations never stops. That's why leading public utilities like the Columbus and Southern Ohio Electric Company choose "Scotchlite" Reflective Sheeting for service equipment identification and protection.

Only "Scotchlite" Sheeting gives 24-hour visibility of emergency units and signs . . . in any kind of weather. Motorists appreciate the nighttime brilliance this unusual product of 3M research gives to barricades, trucks and maintenance cars. And they become increasingly aware of the continual service which typifies today's public utility.

Fleet superintendents, too, appreciate the ease of application and greater durability of emblems and markings made with "Scotchlite" Sheeting.

Once you put "Scotchlite" Sheeting to work for your company, you too will discover how it can help save lives, time and money—and increase public awareness of the service you render. Mail the coupon below for a free booklet, "How distinctive markings work for Public Utilities".

"Scotchlite" is a registered trademark of Minnesota Mining & Mfg. Co., St. Paul 6, Minn. General Export: 99 Park Ave., New York 16, N. Y. In Canada: London, Ont.

PRODUCT OF 3M COMPANY RESEARCH

REG. U. S. PAT. OFF.

SCOTCHLITE BRAND

REFLECTIVE SHEETING

Minnesota Mining & Mfg. Co., Dept. NV-8227, St. Paul 6, Minn.

Please send me free booklet, "How distinctive markings work for Public Utilities".

*Name*_____ *Title*_____

*Company*_____

*City*_____ *Zone*____ *State*_____

Newsletter

(Concluded from page 16)

owner, Clarkfield (Minn.) Tel. Co., purchased Starbuck (Minn.) Tel. Co. . . . Northwestern Bell Tel. Co. purchased all telephone plant, exclusive of station installations and instruments, owned and used by Germantown Mutual Tel. Co. in providing exchange service from the Thief River, Minn. exchange of Northwestern Bell . . . Silver Star Telephone Co., Freedom, Wyo., purchased plant and line of O. Low & Son Tel. Co., Afton, Wyo. . . . Lowell Brown, pres., Valley Tel. Co., Silverton, Ore., purchased Santiam Tel. Co-op, Mill City, Ore.

Le Roy T. Carlson, pres., Northeastern Tel. Corp., has announced the purchases of: (1) Ellmore Tel. Co. which operated exchanges at Brownsville, Huff, Park City, Smith Grove, Oakland, Coneyville and Clarkson, Ky.; (2) Pulaski County Tel. Co., Somerset, Ky.; (3) Science Hill (Ky.) Tel. Co.; (4) Evarts-Harlan Tel. Co., Evarts, Ky.; (5) Rockcastle (Ky.) Tel. Co. . . . Calvert Tel. System, Inc. purchased telephone properties at Bardwell, Arlington, Millurn and Columbus, Ky.

REA Statistical Summary

THROUGH May 1957, loan allocations by Rural Electrification Administration (REA) to telephone companies totalled $381,985,542; 204 telephone co-ops allocated $184,414,192; 336 commercial telephone companies allocated $197,571,350. Funds advanced to borrowers totaled $219,743,394.

REA's telephone borrowers will use loan funds to finance: (1) New construction, $194,147,475; (2) improvements, $165,998,390; (3) refinancing, $2,563,116; (4) acquisitions, $18,637,174; (5) operations, $5,917,396; & (6) other items, $1,063,686. Companies will build 209,106 miles of pole line & add 398,840 subscribers. When projects are completed, companies will serve 844,463 subscribers over 237,399 miles of pole line.

Earnings

GENERAL Tel. Corp., reported consolidated net income for 5 months ended May 31, of $17,637,000, equivalent to $1.32 a share on 13,360,000 common outstanding. Company reported consolidated net in corresponding period of last year of $15,064,000, or $1.21 a share, on 12,404,000 common. Total operating revenues for five months ended May 31 were $104,307,000, compared with $94,404,000 year ago. Including manufacturing and sales subsidiaries, total system consolidated revenues were $194,609,000 compared with $164,053,000 for 5 months ended May 31, 1956. Telephones in service for system May 31 were 2,893,000, including 2,867,000 in United States, 26,000 in Canada & Dominican Republic . . . Cuban Tel. Co., reported net income for year ended Dec. 31, 1956, of $2,341,915, compared to $1,872,001 in 1955. Total operating revenues equaled $18,163,890, increase from $17,658,226 reported year before.

People In The News

FRANK PACE, JR., pres., General Dynamics Corp., elected board chairman & pres. American Council on NATO, Inc. . . . Henry Grady Turner named vice pres., merchandising, Southern Bell Tel. & Tel. Co. He was v.p. & gen. mgr. for So. Bell in Mississippi. Clarence L. Lott succeeds Mr. Turner as Mississippi v.p. & gen. mgr. . . . Dr. Melvin J. Kelly, pres. Bell Telephone Laboratories, was awarded honorary Doctor of Science degree by University of Pittsburgh at University's annual graduation ceremonies . . . C. Carl Sloan, of Atlanta, former v.p. & gen. mgr. for Georgia area of Southern Bell joined general headquarters staff in Atlanta as v.p. on July 15. His successor in Georgia is John S. Seigle, former gen. plant mgr., Indiana Bell Tel. Co., Indianapolis.

REA Loan Allocations

RURAL ELECTRIFICATION Administration has approved the following loans for expansions and improvements of rural telephone service: — (1) Oakwood (Ohio) Mutual Tel. Co., Oakwood, Ohio; $200,000 first loan. Donald Stephens is pres. & Guy A. Carnahan is mgr. of Oakwood Mutual . . . Burlington, Brighton & Wheatland Tel. Co., Burlington, Wis.; $276,000, first loan. Walter L. Kuebler is pres. and Gilbert A. Karcher is mgr. of Burlington, Brighton & Wheatland Tel. Co. . . . Rural Tel. Service Co., Lenora, Kans.; $190,000, second loan. Leland Archer is pres., and Carroll K. Nelson is mgr. of Rural Tel. Service Co. . . . Pineland Tel. Co., McGregor, Minn.; $900,000, first loan. O. L. Johnson is pres. & mgr. of Pineland Telephone Co. . . . Standard Tel. Co., Cornelia, Georgia; $618,000, second loan. H. M. Stewart is pres. & mgr. of Standard company.

New FCC Chairman

FCC COMMISSIONER John C. Doerfer, member of FCC since April 15, 1953, & the first FCC Commissioner appointed by Eisenhower administration, received long-expected designation as FCC Chairman on June 26. Retiring FCC Chairman George C. McConnaughey announced that he & his assistant in charge of Congressional liaison, Robert D. L'Heureux, will join veteran Washington radio lawyer George O. Sutton in new firm of McConnaughey, Sutton & L'Heureux.

USITA To Employ Radio Engineer

THE US Independent Telephone Association Executive Committee has authorized employment on full-time basis of qualified radio engineer to be attached to association's Washington office. Increasing number of cases pending before FCC involving radio matters of interest to common carriers, among them current microwave hearings, scheduled lease-maintenance hearing, & future consideration of use of frequencies between 25 & 890 megacycles, has been placing greater demands on USITA staff.

Radio engineer to be hired by USITA must have degree in electrical engineering from accredited college or university, state license in radio or radiotelephone engineering.

Reserve Advertising Space Now!

FALL Construction and Maintenance Issue

Telephone Engineer & Management

September 15, 1957

Probably the most valuable sales aid of the year for manufacturers and firms selling telephone equipment, supplies and services to the $17 Billion telephone industry. Special editorial features on new methods of construction, new wrinkles in maintenance plus many new products being introduced for the first time will cause this issue to be saved and referred to time and again. Plan your advertising to take full advantage of this important number.

ADVERTISING FORMS CLOSE SEPT. 1

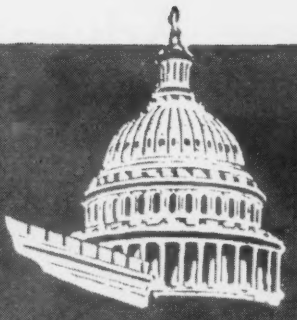
The 1957 FALL CONSTRUCTION ISSUE

SEPT. 15, 1957 FORMS CLOSE SEPT. 1

TELEPHONE ENGINEER
Publishing Corporation

7720 Sheridan Road, Chicago 26, Illinois - Phone ROgers Park 4-3040

WASHINGTON NEWSLETTER



Significant NLRB Decision

AFTER ALMOST two years of proceedings, the National Labor Relations Board has declined to make a determination in a case where a decision had been long awaited because of the broad implications it could have had in the telephone industry.

In a significant development, the NLRB has decided that it would be beyond the board's delegated powers to make a determination in a dispute between the Bell Telephone Co. of Pennsylvania and the Pennsylvania Telephone Union involving a question of the status of traffic department "supervisors."

At the same time, the NLRB reported that it was also dismissing a petition of the Ohio Consolidated Telephone Co. in a case involving a dispute with the Communications Workers of America over the status of certain employes on the same grounds as those stated in the Bell of Pa. case. The question in Ohio was whether the titles "head lineman," "head switchman," "service assistant," and "head house serviceman" are "supervisory."

In the Bell of Pa. case, the company in the summer of 1955 asked the NLRB to determine whether some 1100 of its employes who work in 189 telephone exchanges and who hold the job title of "supervisor" are supervisors within the meaning of the National Labor Relations Act. If so, they would be excluded from the bargaining unit represented by the union, which is affiliated with the International Brotherhood of Electrical Workers.

The union took the position that the employes in question are not supervisors, and should be continued in the bargaining unit represented by it. However, the IBEW affiliate argued, in an oral proceeding held by the NLRB in September, 1956, that if the board should find that the employes in question are supervisors, under the definition of the act, then there are other employes, such as senior operators, having similar authority and duties, who likewise should be excluded from the unit.

Pointing out the company and union negotiated contracts by agreement for 15 years without prior NLRB certification and that neither party asked for an election, the board said: "We have concluded that the board has no such authority, and that the rendering of advisory opinions in the absence of any question concerning representation is beyond the power conferred upon the board by Congress."

The NLRB order said that "at best a decision herein would be an advisory opinion binding on no one . . . We do not think that Congress wished to place the board in the position of dissipating its funds and energies in the capacity of arbitrator, mediator, or conciliator, by providing a forum for parties to submit their questions on a piecemeal basis without any reasonable assurance that the board's determination will thereby finally resolve even the specific problem presented by the parties.

"This is not a discretionary matter. It is a fundamental question of the existence of legal power. Being convinced that the board has been acting beyond the scope of its delegated powers under the act in making such determinations, we have no alternative but to discontinue doing so."

Aside from letting unanswered an important question related to a collective bargaining unit in a telephone company, the NLRB statement sets forth a newly-established policy for the federal agency that, in effect, removes a power that the board has exercised in the past.

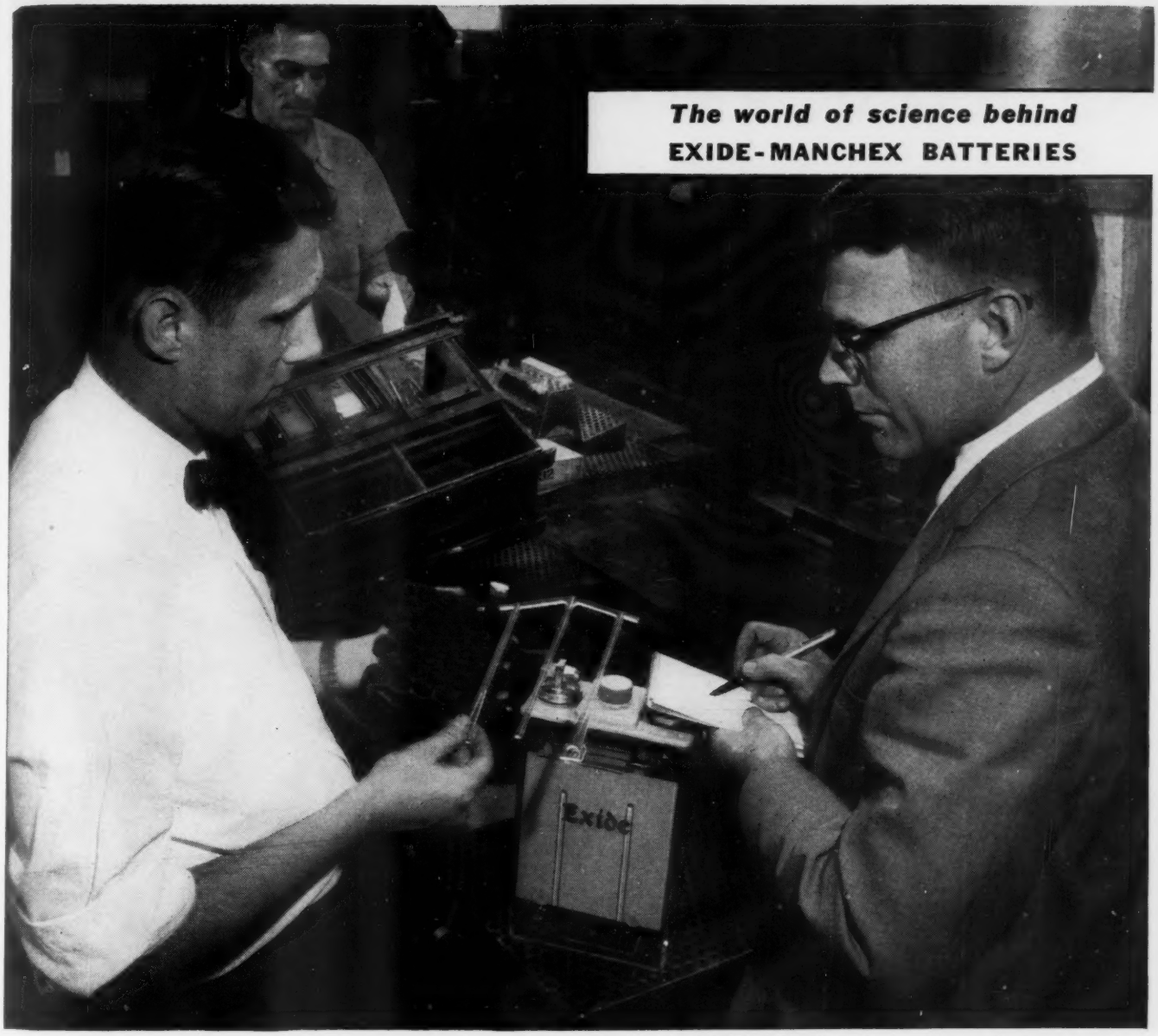
In its order, the board has indicated that if the telephone industry now wants a NLRB definition of the term "supervisor" it will have to come as the result of a representation election for a collective bargaining unit under the board's auspices, or through settlement of a dispute over the appropriate unit previously certified by the board.

Significant in the board's orders in both the Bell of Pa. and Ohio Consolidated cases is the declaration that the board does not recognize itself as having authority in a situation where a union is accepted as the bargaining unit by a company without the formality of a NLRB-conducted representation election.

Ohio Reversal

ANOTHER unique development before the NLRB in recent weeks was the action of the General Counsel's office calling on the full board to reverse the initial decision of Examiner C. W. Whittemore

Please turn to page 24

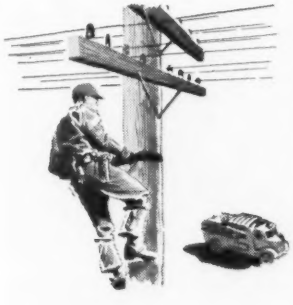


The world of science behind
EXIDE-MANCHEX BATTERIES

Being interviewed is E. L. Daniels, Jr., development engineer

"These wide open spacers boost battery power"

At the Exide Laboratories—**Reporter:** When is it most important for a battery to have maximum power, Mr. Daniels?



Daniels: Under short, heavy loads—such as when equipment is switched on or off.

Reporter: How do the wide open spacers help?

Daniels: By providing a shorter, more direct current path between the plates. Hence the internal resistance of the battery is reduced. This is reflected in improved voltage, increased current capacity, and less heating under load.

Reporter: Are there any other advantages to these spacers?

Daniels: Yes, electrolyte has easier access to plates for better constant load battery performance. And the open spacers allow used active material to fall more readily to the bottom of the jar.

Reporter: Obviously, this is an important feature of Exide-Manchex Batteries.

Daniels: Yes it is. But it's only one of the many engineering details that contribute to their long life and high performance.

Note to battery users: Whenever you order batteries for float or cycle service in stationary applications, be sure to specify Exide-Manchex. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY Exide®

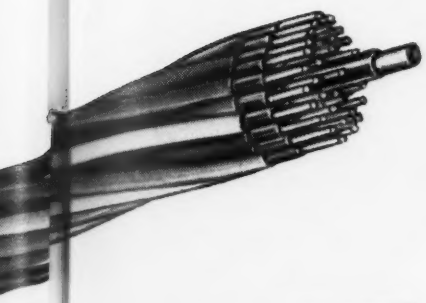
Want High Quality

Whitney Blake can fill ALL your needs

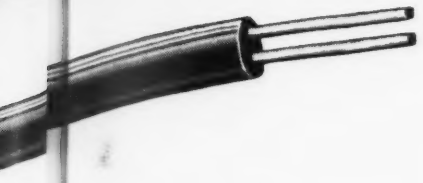
WB

WB has that which so many others have yet to gain . . . EXPERIENCE

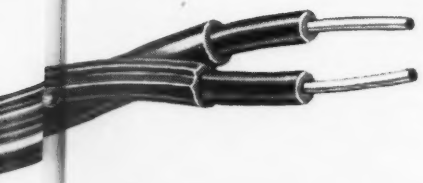
DISTRIBUTION WIRE?



MULTI-PAIR DISTRIBUTION WIRE . . . Self supporting, available in 3, 6, 11 and 16 pair No. 19 AWG copper, polyethylene insulation and color-coded polyvinyl chloride covering.



PARALLEL DISTRIBUTION WIRE . . . Self supporting, available in extra high strength 30% Copperweld No. 14 AWG and .080". Insulated with WB special, tough black polyethylene compound.



TELEPRENE® DISTRIBUTION WIRE . . . Self supporting, available in No. 14 and No. 16 AWG hard copper conductors rubber insulated and neoprene jacketed.

ARMORED TELESEAL DISTRIBUTION WIRE . . . For direct burial, in No. 16 AWG soft copper conductors with specially developed, low moisture absorbing rubber insulation. Served armor of flat steel wires, neoprene jacket.

TELESEAL® DISTRIBUTION WIRE . . . For direct burial, available in No. 16, No. 14, or No. 12 AWG hard copper conductors, specially developed, low moisture absorbing rubber insulation, neoprene jacketed.

WHITNEY BLAKE has a complete line of distribution wire to serve the Independent Telephone Industry no matter what the need may be.

From one source — WHITNEY BLAKE — telephone companies can fill all their requirements with assurance of one high standard of quality . . . quality that has again and again demonstrated that the best wire — the longest lasting wire — is far more economical than a lower priced, short lived wire that needs early replacement.

WHITNEY BLAKE telephone wires are made by experienced wire makers and have proved their value in years of long service across the nation.

60 YEARS OF INDEPENDENT TELEPHONY
INDEPENDENT
1897 — 1957

Well Built Wires Since 1899

©1957

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

PAGE
LASHING WIRE

You get a neat and long-lasting job every time you use PAGE Stainless Steel Lashing Wire! Ideal for lashing conductor cables (lead or neoprene covered) to a strand messenger by Neale or Western Electric Machine. Coils tailored to fit machine specified.

3 GRADES • EACH IN 2 SIZES (.065 and .045)

Type 430 • for use with galvanized messengers
Type 302 • for use with stainless messengers
Type 316 • for use under severe corrosion conditions

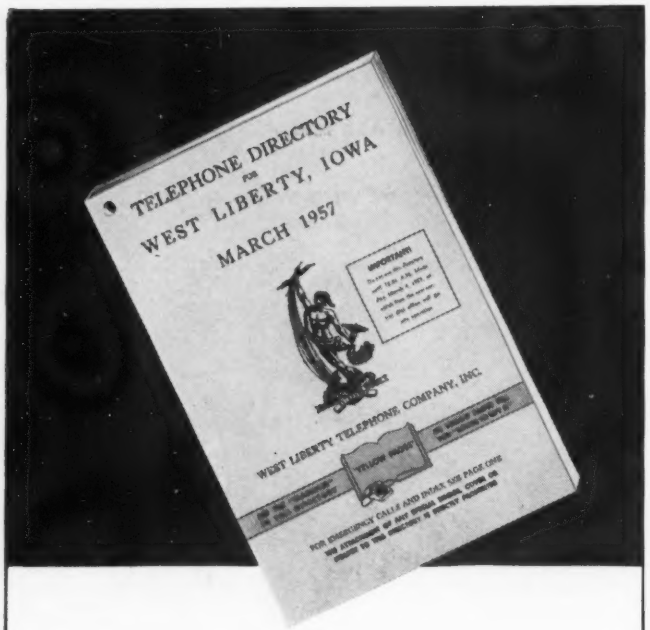
Furnished six coils in cardboard carton (minimum order).

Other fine-quality products • You can depend upon PAGE Strand (Stainless or Galvanized Steel) and PAGE Stainless Dead-End Wire • See your Telephone Supply Distributor, or write our Monessen, Pa., office.

Page Steel and Wire Division
AMERICAN CHAIN & CABLE

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

ACCO
TRADE MARK



A directory for the
West Liberty Telephone Company, Inc.
printed by

R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16

Washington

(Continued from page 20)

looking toward dismissal of unfair labor practice charges in connection with the 7½-month strike of the CWA against Ohio Consolidated.

Two NLRB attorneys, Daniel P. Dooley and Clifford L. Hardy, in a brief supporting their exceptions to the examiner's decision, accused Mr. Whittemore of "gross bias and prejudice." Mr. Whittemore had concluded that the union and its members were not responsible for 29 acts of violence cited in the unfair labor practices, and he contended that the company had provoked strike violence..

In their brief urging the board to upset Mr. Whittemore's ruling, the NLRB staff members charged that the examiner "distorted the facts and ignored the evidence."

The NLRB is not expected now to come up with a final decision in the case for as much as a half-year.

While the General Counsel's office of the NLRB has disagreed with Trial Examiners and even the board in previous cases, the brief by the two attorneys in the Ohio Consolidated case was particularly critical of the examiner and used stern language in rebuking him for what was considered "bias" in the case.

Microwave Proceedings

SIGNIFICANCE of the present microwave policy proceedings before the Federal Communications Commission was keynoted in the statement of American Telephone & Telegraph Co. Chief Engineer Gordon N. Thayer, when that company made its appearance during the lengthy proceedings, that the Bell System believes "that the future development of communications in this country will be determined in large measure by the frequency allocations and policy decisions made by the Commission in this proceeding."

The Bell System, in outlining its position before the Commission, called on the FCC not to enter into a policy of unrestricted licensing of private microwave systems for general business and industrial purposes.

The AT&T supported continued assignments by the Commission of microwave frequencies for public safety purposes and for right-of-way companies, such as railroads, pipelines and power companies. But it hammered consistently on the view that private systems for general business purposes not only would seriously impede the common carriers' ability to meet public service requirements, but would mean less efficient use of frequency space.

The FCC was called upon for exclusive frequency bands for common carrier use. It was stated that assignments to private systems in bands available to common carriers would block the development of com-

Please turn to page 69

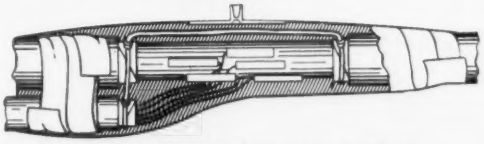
REG. U. S. PAT. OFF.

SCOTCHCAST BRAND Pressure Splice...

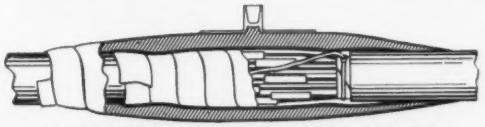
POSITIVE SEAL for FIELD SPLICES

REG. U. S. PAT. OFF.

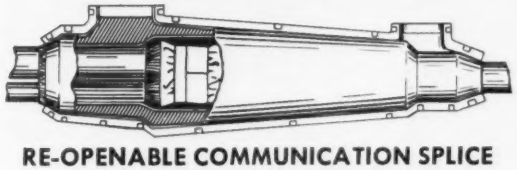
SCOTCHCAST BRAND seals all these splices:



WYE COMMUNICATIONS SPLICE
—use "SCOTCHCAST" Pressure-Splice



NON-IMPREGNATED CONDUCTOR
—use "SCOTCHCAST" Pressure-Splice



RE-OPENABLE COMMUNICATION SPLICE
—use "SCOTCHCAST" 89 series Kit

COMMUNICATION INLINE SPLICE
—use "SCOTCHCAST" 82-A series Kit

"UNIPAK" *Container holds laboratory-correct mixture of "SCOTCHCAST" Resin No. 4 to make a quick, easy, factory-quality splice insulation in the field.*

Here's a revolutionary new method of sealing field splices made possible by "SCOTCHCAST" Epoxy Resin in the easy-to-use "UNIPAK" container. This new "SCOTCHCAST" Pressure-Splice method provides a simple, practical, and quick way to seal field splices on communication or power cables where the size, shape, position, or inaccessibility of the splice make gravity-pour resin-sealing methods difficult. The Pressure-Splice method even works upside-down as illustrated.

For further information, just write on your letterhead to: 3M Co., St. Paul 6, Minn., Dept. MI-77

REG. U. S. PAT. OFF.

SCOTCHCAST BRAND Splicing Kits

...by the makers of
"SCOTCH" Brand No. 33 Electrical Tape

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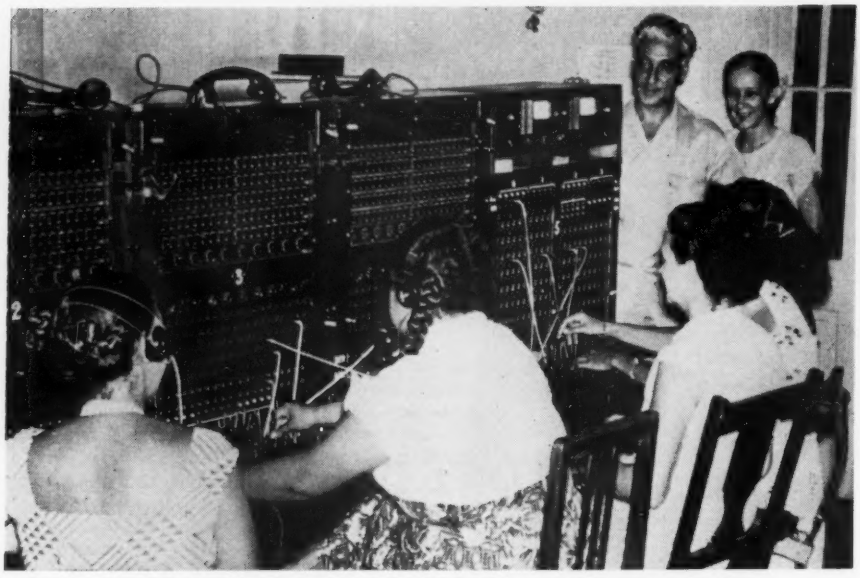
PRODUCT OF 3M COMPANY RESEARCH

PEOPLE IN THE NEWS

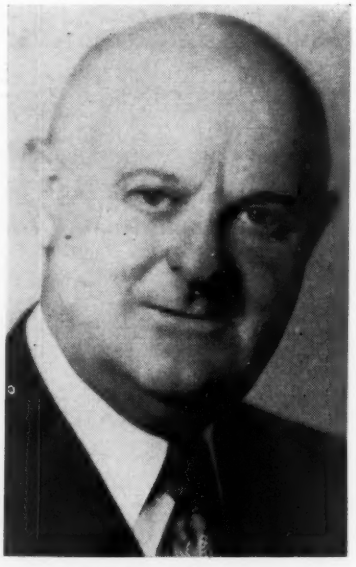


FIVE POSITION MAGNETO SWITCHBOARD in the office of Postes and Telegraph at Papeete, Tahiti, headquarters for French Oceanica. Four of the five positions of the switchboard were made in France. The fifth position is a Kellogg board installed during the war. This office services about 600 telephones all on the island of Tahiti. Among the other islands, of which there are 300, there are 800 more telephones. A new dial switchboard and telephones will be installed at Papeete in two years time. The people in the picture are: M. DE QUINCENET, resident engineer; M'LLE. MARIE HUGON, office manager; and four Tahitian Operators. — *(Photo from Dan McNulty, Chicago)*

H. F. LELLO, executive vice president, Automatic Electric Co., shows radio-TV star FRAN ALLISON some of the equipment the company used in its display at the Chicagoland Fair, June 29 to July 14. Miss Allison, famous for her roles on the Breakfast Club and Kukla, Fran and Ollie was official hostess of the Fair. Replicas of the first automatic telephone and the first dial telephone, both Automatic contributions, stand at rear. A 1905 desk model telephone stands between an array of the 11 colored telephones, including a loudspeaking model, now manufactured by the company. Miniature telephone models were displayed in the foreground. The Fair, sponsored by the Chicago Association of Commerce and Industry, was staged at the city's famous Navy Pier.

BEN A. LINDHOLM, general auditor of California Water & Telephone Company since 1939, has been elected treasurer of the company. He replaces Guy D. Lamp who retired on May 1 after 34 years with the firm.

The new treasurer joined an early predecessor of the company in 1928 as an accountant in the San Francisco headquarters. When the present corporate name was assumed in 1935 he was appointed assistant to the general auditor.



THE APPOINTMENT of Raymond H. Burfeind as special consultant for telephone battery application has been announced by the Industrial Division of Gould-National Batteries, Inc., Trenton, N. J. Under Mr. Burfeind's guidance, Gould will expand its customer service program for all telephone battery users.

A retired sales executive of the Automatic Electric Co., Chicago, Ill., extensive background of over 50 years association with the telephone industry.

ground rules
FOR GOOD GROUNDS
FOR RELIABLE, LOW-RESISTANCE GROUND CONNECTIONS THE YEAR 'ROUND . . .
use the proved, low-cost method of deep grounding with Copperweld Sectional Ground Rods.
drive multiple sections —as many as are needed to reach the good conducting soils of constant moisture.
measure resistance after each section is driven, allowing for seasonal variation.
to be sure of permanence be sure to drive Copperweld the only Molten-Welded ground rods.

YOU'RE *Positive* WITH THE **MOLTEN-WELD**

Once it's driven, your ground is in to stay, when it's non-rusting Copperweld. This micro-photograph of the weld area shows how the grains of copper and steel interlock to form a permanent, continuous weld. No other process achieves this inseparable union

By following these practical ground rules, using Copperweld* Sectional Ground Rods, you can be certain you'll get the very best results from your protective equipment—not only during wet seasons, but throughout the year. There's no better or more economical way to improve line performance, increase safety, and reduce service interruptions.

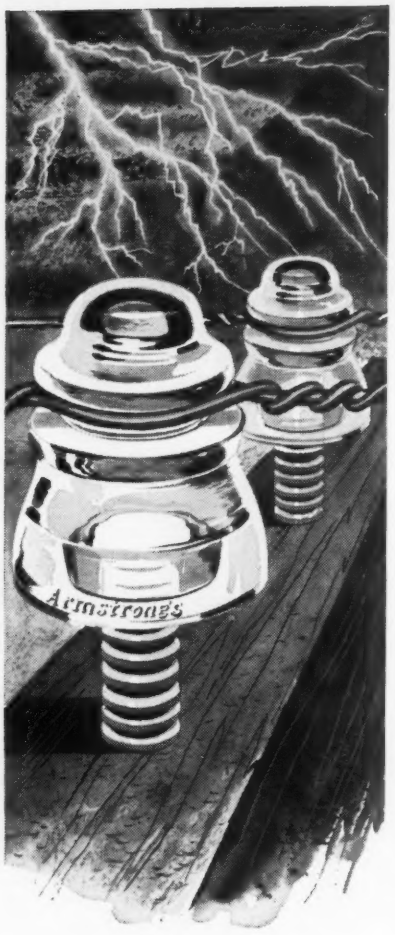
Trade Mark

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

Drive DEEP with

Copperweld TRADE MARK

sectional ground rods



Weatherproof

Laboratory tests and actual field experience prove Armstrong Glass Insulators resist weathering, thermal shock, punishing line strains . . . and still perform at peak efficiency. These all-weather insulators, molded of heavy industrial glass, stay on the job and save you maintenance costs. For information about the models best suited for any given application, write Armstrong Cork Co., Glass and Closure Div., 295 Fifth Ave., New York 16, N. Y.

Watch Armstrong Circle Theatre every other Tuesday evening on NBC-TV

Armstrong
GLASS INSULATORS
for communications . . . for power

REVENUE BOOSTERS

"Car-Seat Dialing"

ILLINOIS BELL has another drive-in convenience: The drive-in telephone.

"Motorists can now park beside a telephone and talk while in the car," P. L. Sainsbury, Illinois Bell Telephone Company's general public telephone manager, says. "It'll be especially handy for the public in bad weather."

Two experimental drive-in telephones have been installed in Chicago and three others will be installed later. The new drive-in telephones on Chicago's Outer Drive will supplement regular telephone booths installed on the Drive about a year ago.

Chicago and Mobile, Ala., were selected for the drive-in phone trials because of the "complete range of weather conditions," Sainsbury said.

The weatherproof drive-in telephones are enclosed in a three sided plastic translucent hood. The telephone and hood set on a steel post and will be lighted at night. A sign will read, "*Phone From Your Car Here.*"

The latest coin telephone — equipped with retractile handset cord and extra weatherproofing — is fastened to a very tough and durable manganese-bronze ..support plate. A bright-colored plastic hood partially encloses the unit and offers protection from bad weather.

The telephones are at the level of an average passenger car window, lessening motorists' "stretch effort."

Illinois Bell says that careful studies will be made of public reaction and suggestions during the trials.

CAR-SEAT DIALING is the watchword for comfort of the motorist in this new drive-in telephone installation. Here, MARVA JEDD, of Chicago, demonstrates the ease of handling from her car window. This telephone, weather-proofed and lighted at night, is one of three installations at various locations in Chicago.

ACME VISIBLE

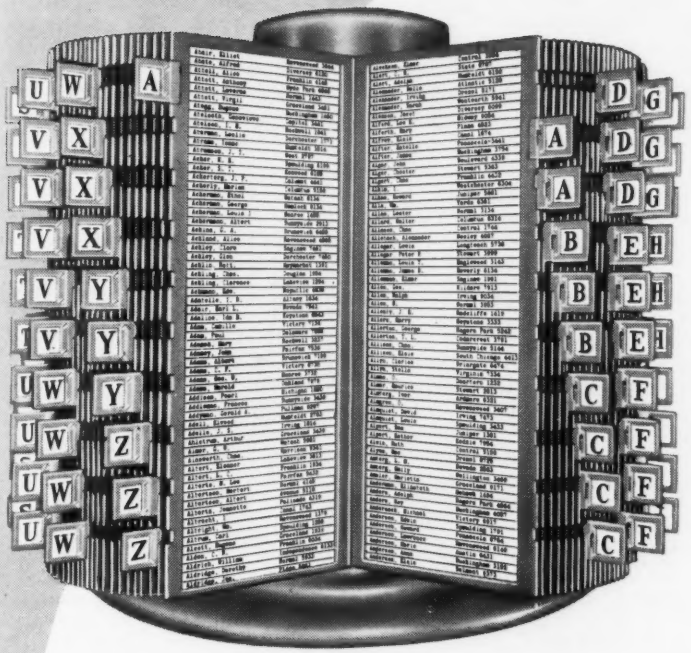
FLEXOLINE

equipment for INFORMATION RECORDS

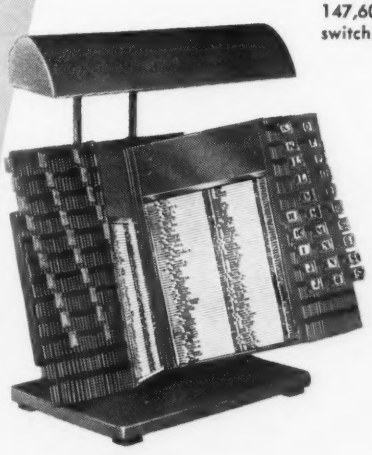
Speed up your central information switchboard records by making *all* of your telephone listings conveniently available to every information operator.

Through the use of Acme FLEXOLINE Equipment, telephone companies have been able to render an improved service at lower cost, speed up service and cut many corners in operation. The ease with which new names or listings are inserted in their correct places helps to keep lists always up to date, in many cases within a few minutes after the change has been completed.

Regardless of the type of switchboard you use or the number of subscribers you have, there is an Acme Time-Saving FLEXOLINE modern, hi-speed reference unit that will exactly meet your individual purpose.



Revolving stands provide compactness and great capacity . . . in single or double tier units they hold from 7,000 to 147,600 listings. May be used on desk, switchboard or mounted on pedestals.



Desk stands, individual units with up to 32,800 listings capacity or in banks of a number of stands, for greater capacity.

Insite Index for small information lists or any other list where speed and accuracy are essential. Used on key shelf or desk. In a wide range of sizes and capacities from 350 to 2,500 listings.

Acme Visible Equipment has been designed for telephone use by Acme Systems Engineers in close cooperation with practical, experienced telephone experts. Tell us your requirements and receive our suggestions and quotations.

MAIL COUPON NOW!

ACME VISIBLE RECORDS, INC. Telephone System Division, Crozet, Virginia

Please send us illustrated booklet S-7-15-57

☐ #1088 on Acme Switchboard Keyshelf Units ☐ #975 on Acme Flexoline

☐ Have representative call. Date_____ Time_____

☐ We are interested in Acme Visible equipment for_____ (KIND OF RECORD) records.

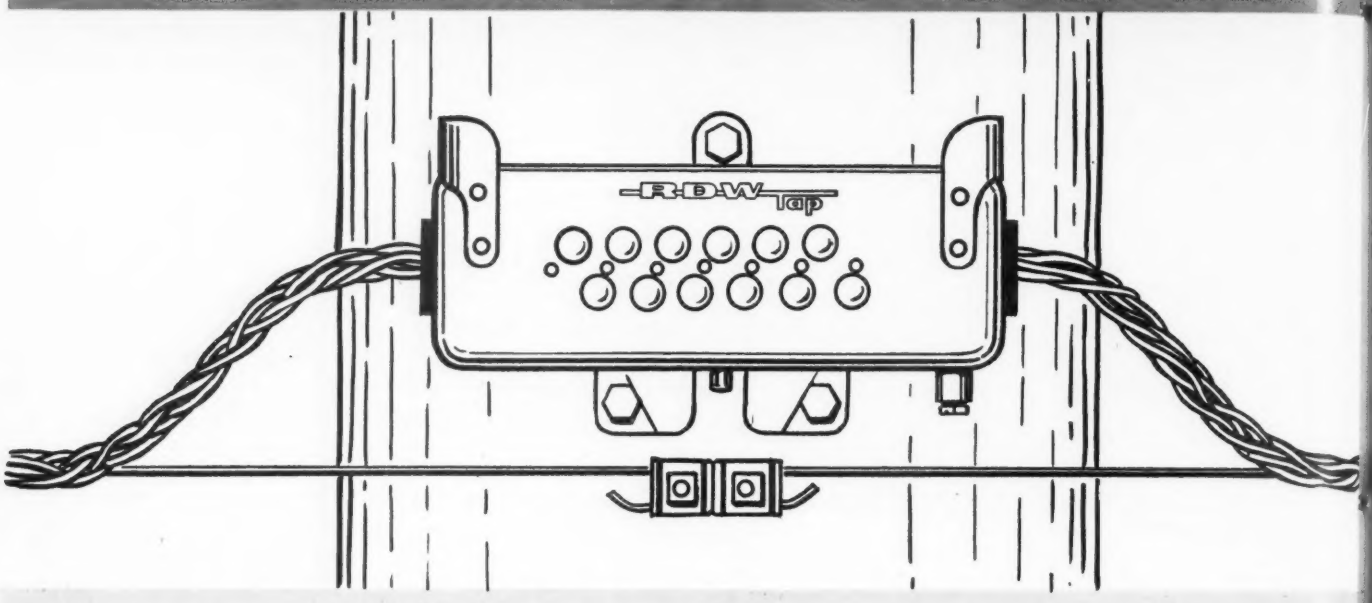
COMPANY_____ ATTENTION_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

FOR THE FIRST TIME

A SIMPLE RDW* Tap



NO CUTTING
NO SPLICING
NO TAPING
NO ADDED IMPEDANCE

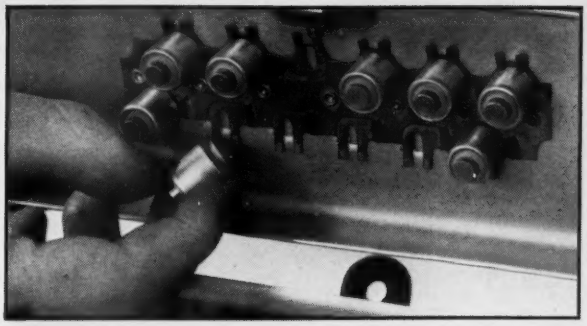
Just a logical and economical method of connecting subscriber drops to the rural distribution wire running straight through the RDW TAP. Installation of the unit has been greatly simplified by the following:

1. Mount the RDW TAP with the lag screw bracket to the pole without gaining.
2. Provide adequate RDW line slack.
3. Cut out the excess RDW messenger line slack.
4. Anchor cut ends of RDW messenger wire to pole below the RDW TAP.
5. Separate selected pairs and connect to face plate studs without cutting or splicing.
6. Insert drops and connect to designated studs.

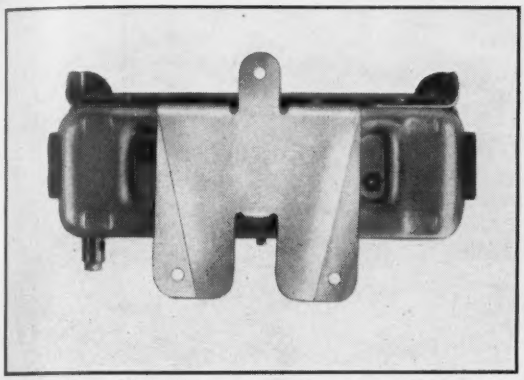
The RDW TAP provides a low-cost maintenance test point, and additional drops can be installed without opening splices or installing additional equipment. Sizes range in 6, 11 and 16 pair capacities.

Protection is optional but can be added later on a pair by pair basis with Cook Minigap or Mytigap arresters.

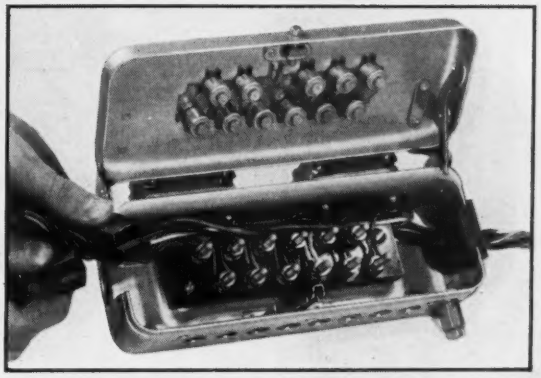
*Rural Distribution Wire



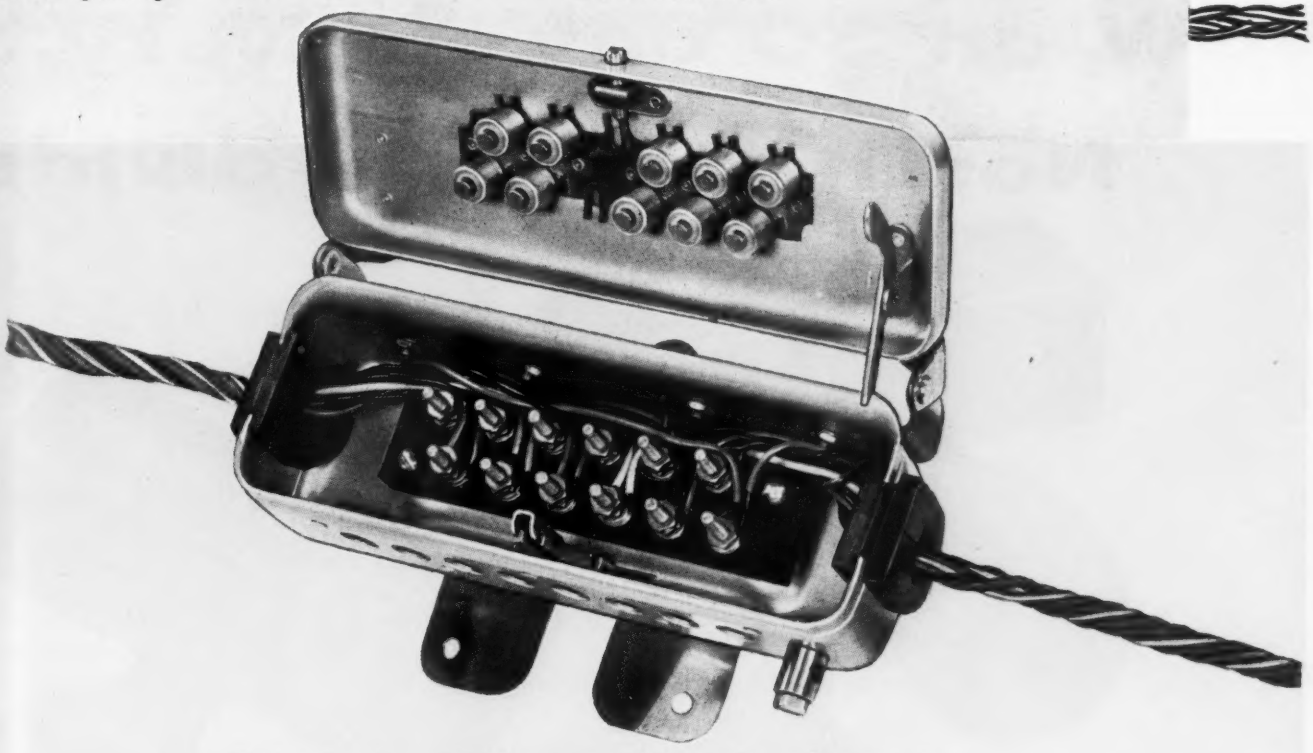
RDW TAP contains the salient features of the Cook Stranterm.



Bracket for mounting direct to the pole without gaining.



Split grommets provide straight through wire installation.



Optional pair protection, accessible studs and room to sort selected pairs is provided by this compact assembly.

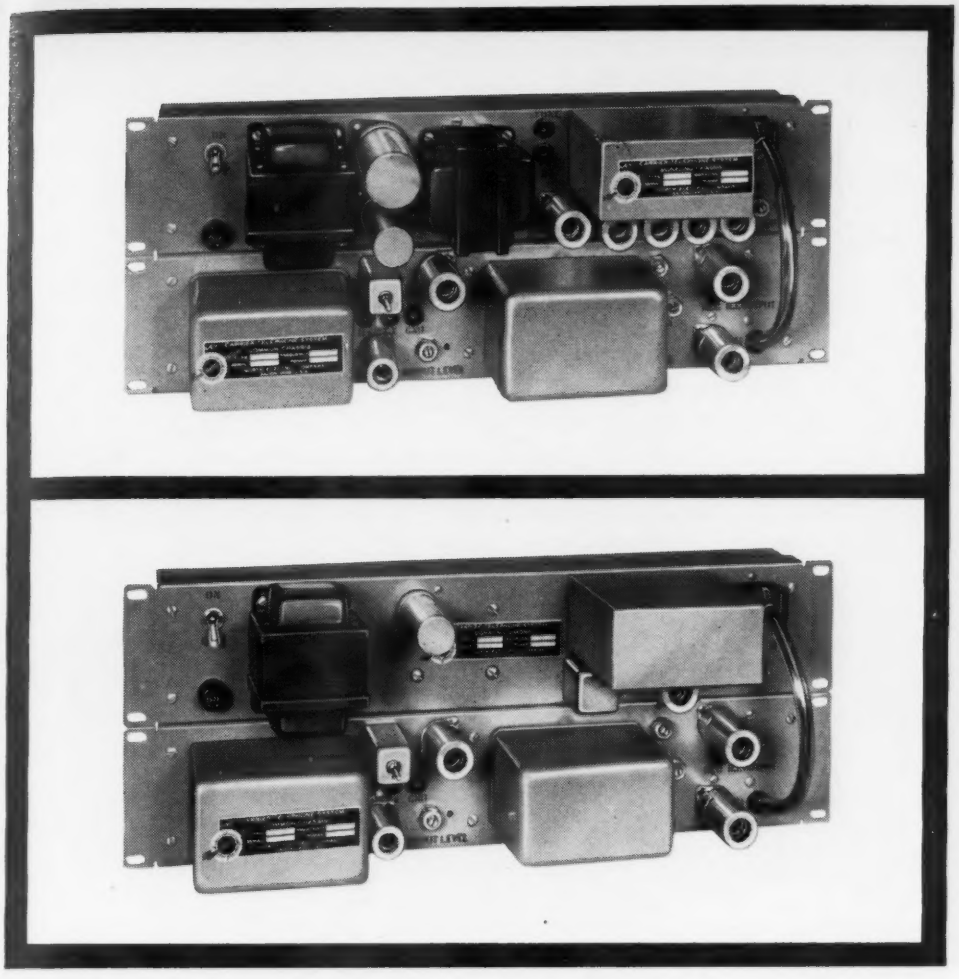
COOK ELECTRIC Company

Since 1897

COOK ELECTRIC COMPANY CHICAGO 14, ILLINOIS

NOW on 30 day delivery....

North low-cost divider



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low cost, high quality, minimum maintenance, simple line up

With the use of 5 channels of North Divided Ringing Carrier you can serve 60 telephones over 1 physical pair, with each phone ringing independently.

Added revenue can be yours immediately without the tremendous expense of physical line construction.

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EARLY TELETYPEWRITER

TELETYPE MODEL 28 PRINTER

A new idea—the first really practical telegraph printer—put the company now known as the Teletype Corporation in business in 1907. And—since we have stressed research from the beginning—new ideas have been coming from our laboratories ever since.

Today, equipment made by Teletype flashes news, messages, orders, reports, reservations . . . classifies freight cars . . . coordinates industrial production lines. It provides a "conveyor system" for channeling complex raw data to computing centers thousands of miles away . . . transmits and reproduces text and punched tape for office automation . . . and simplifies the handling of many other modern "chores."

Ideas like these are being applied to customers' problems by communications companies every day, increasing revenues from private wire and teletypewriter exchange services.

For basic information on the application of Teletype equipment, write for a copy of our booklet, "The ABC's of Teletype Equipment." Teletype Corporation, Dept. TEM7, 4100 Fullerton Avenue, Chicago 39, Illinois.

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1957 Golden Anniversary Year

EDITORIAL

"Money — Money — Money"

THE OTHER night we did a bit of research on notes taken at recent state telephone conventions. After a proper amount of shuffling and classifying, we realized the majority of our memos pointed up the fact that, *today, the telephone industry's most pressing problem is financing.*

Of course, we well know the telephone industry is not alone with this problem. Today, it is a common problem.

However, in most businesses — manufacturing, for instance — the greater part of the money for expanding the plant normally comes out of the company's profit and non-regulated businesses can price their products at any figure they like — as long as the public keeps buying.

But a telephone company, as a regulated utility, is not permitted to make enough profit to finance more than a minor part of its construction program out of its earnings. Most of the money needed must come from *investors.*

So whether the telephone industry can give the public billion's of dollars worth of additional telephone facilities this year and in the coming years, will depend, we believe, on how willing people are to invest their savings in the telephone business.

The records of the past and the present well prove that members of the investing public will consider all types of investment opportunities, and will furnish the telephone industry the dollars it needs only if they think the telephone business offers them — and will continue to offer them — an adequate return.

And right there we hit a sore spot, for the records prove many telephone companies have had, and are having, trouble raising capital because investors aren't sure of the companies' ability to keep rates in line with revenue requirements because of regulating restrictions.

Of course, inflation is one factor in the picture; the current "tight money" situation with its high interest rates is another.

To combat these factors — inflation and tight money — it seems to us if subscribers are to get the best service at the lowest cost over the long pull, telephone companies must be allowed to earn enough now to justify bold, broad planning for the future and the long-term risks new revolutionary service improvements require.

Given sufficient earnings, a telephone company can choose the type of construction program that promises the best return over the years ahead. Taking the long view may mean greater initial cost and longer-term risks. The alternative is a program that costs less at the outset, but more later on, with poorer long-range results.

In our opinion better earnings would benefit everyone: —

Subscribers would benefit from new and more valuable services, and from rates kept low through efficiencies made possible by better methods of providing those services.

Share owners would benefit, too. Better earnings for the telephone company would insure a fair return for the use of investors' money. To be fair, the return must compare favorably with those offered by other investment opportunities. With huge amounts of new capital to be raised this year and in the future, earnings must be high enough to attract *new* investors, too.

All who work for the telephone company would also benefit, for a prospering company that can plan for the long run can provide: *more* jobs as the business grows; *better* jobs with wider opportunity; and *more stable* employment.

In short, everybody would benefit from better earnings — and with everybody happy today's money problems would ease.

Adequate earnings, therefore, is the key to the solution of insuring shareowners a fair return for the use of their money, encouraging them to invest additional funds, and attracting new investors.

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DID YOU KNOW THAT...

in the modern hand-set development Kellogg was the first to introduce a successful non-positional transmitter.

We have exactly
what you want . . .
the KELLOGG K500
telephone in both desk
and wall models

Guess who suggested using more paystations!

It all began when Jim Brown did a little survey on the side. He found many busy locations where more outdoor paystations would offer a good source of added revenue. That convinced the boss, so AUTELCO paystations were installed in some of these new spots.

Result: company revenue really jumped! Jim's co-workers have nominated him "King of the Full Coin Box", and it's rumored Jim is in line for promotion.

You, too, can help bring in added revenue. Write for our Survey Simplifier. It shows you how to pick the locations that will pay best. Address: *Automatic Electric Sales Corporation, Northlake, Illinois.*
Or call FIllmore 5-7111.

AUTOMATIC ELECTRIC

A member of the General Telephone System
One of America's great communications systems

GENERAL SYSTEM

Plant Engineering Construction & Maintenance

By W. M. DRIGGS*

"PLAN for the 1970's — and then design today's plant to fit into that plan."

JUST WHAT are our plant functions? I would like to divide them into three major categories — namely:

(1) To design the outside plant, providing adequate, dependable service at a reasonable cost.

(2) To properly construct the plant — taking full advantage of improvements in techniques, materials and tools.

(3) To effectively maintain the plant — to insure dependable and satisfactory operation of plant facilities.

Probably the most important of these three is the *design of the plant* — and I use the word "design" quite broadly. It includes the over-all functions of engineering, whether it be future planning, basic design, engineering principles, economics and/or a number of other related engineering responsibilities.

Future Planning

LET US REVIEW future planning. This is often known as fundamental or long range planning and should be a *must* in your operations. The success or failure of your operations could easily be dependent upon the judgment used in planning for the future. This is therefore, important to you — whether you operate a large company or a small company.

THE SUCCESS or failure of your operations could easily be dependent upon the judgment used in planning for the future.

Right now you may get ahead of me and say to yourself — *"I cannot spend now for something I will not need for several years."* I do not suggest spending today for a gain in the 1970's — but I do sincerely recommend that you *plan* for the 1970's — then design today's plant to fit into that plan.

A number of State Telephone Associations have adopted a 1957 theme for promoting future planning. Long range or future planning is just what the Independent telephone industry must do, if the companies are to assume their proper places in our national economy.

Planning today for tomorrow's progress will present certain obstacles — things which we cannot today foresee — things which may or may not happen. These, of course, would have some affect on our plans — but most of us in this telephone business take obstacles in stride and quite often take advantage of them. Let us plan our course to avail ourselves of population trends, financial trends, service trends, station movement trends, etc.

The major objectives in good fundamental planning for your plant program are:

First: — Determine the proper engineering periods

WE ARE obligated to our subscribers, our investors and the regulatory bodies to not only plan our programs well, but to construct the operating and distributing plant to the best of our ability.

**Mr. Driggs is engineering director, General Telephone Service Corp., New York City.*

for, (a) The exchange plant — by exchanges, and (b) your toll networks.

Second: — Provide the plan for the design of adequate plant, (a) to meet long-range service demands; (b) to provide for the near-future forecasted growth; (c) to meet effective plant operating standards, and (d) to be consistent with sound economy.

Third: — Develop a long-range financial plan — one which reflects the amount and timing of new money requirements — which will meet the service demands predicated upon realistic estimates of operating expenditures and associated revenue requirements to maintain satisfactory earnings.

Planning involves a number of operations which I will enumerate for you and, in the interest of brevity, will only define:

(1) Determine the proper engineering period — i.e., three, five or 10 years or longer. This will depend on your local problem.

(2) Make a Commercial survey of the exchange area. This survey should include a forecast of the stations required and a forecast of the lines required.

THE BETTER our service — the more valuable it is to our subscribers. Good service is a sure method of selling your company to your Regulatory Commission. Many rate cases are settled only after satisfactory service is assured.

Consideration should be given to the present trend to a higher grade of services. This data should be developed by small areas for use in cable design.

(3) Prepare an outside plant map on which is shown a schematic of the plant. The survey data should then be placed along the plant at strategic locations.

(4) The proposed feeder routes can then be established — the size of the cables to be determined by the cumulative survey figures.

The following cable routes can then be established for: (a) Cross feeder cables; (b) relief feeder cables; and (c) Distributing plant.

(5) Determine the transmission limits of the exchange. Prepare a zone map showing the various limits for use in selecting the proper cable gauges.

(6) Familiarize yourself with the method of calculating present worth, future worth, cost of money, taxes, annual charges, etc.

You are then ready to plan your outside plant program and here are a few of the major problems which are most important:

(1) Central Office Site: The site of the central office cannot be determined until the Commercial survey has been completed. This survey must be sound and reasonably complete — the success of future plans is dependent upon the reliability of data used in the survey.

The office site should be located at the wire center or as near to it as possible. Due consideration should be given to plant relocation costs, building expansion possibilities, fire hazards, etc.

(2) Central Office Building: The type of building should be on the conservative side and preferably designed to blend with the surrounding buildings — subject, of course, to reasonable limitations.

Special emphasis must be placed on the physical structure's meeting all local climatic conditions — particularly humidity. You may wish to give consideration to a temporary-type wall where there is a possibility of an extension at a later date.

The size of the building will be determined by the equipment and office space requirements with provision for growth as needed, subject to appropriate cost studies — made by you, and not your architect.

(3) Feeder Routes and Cables: Extreme care must be exercised in the selection of the feeder cable routes. Usually, in small exchanges, feeder routes extend in each of the four compass directions from the office with cross feeders extending in each direction from these cables as required. Feeder routes also are located as close together as three or four blocks in the larger exchanges. This is conducive to the use of cross feeder relief cables which quite often defer large expenditures in main feeder cable replacement.

The size of these feeder cables is determined *entirely* by your Commercial survey figures. The location of tapering points is dependent also upon the cross feeder and relief cable plans. It is, therefore, extremely important that preliminary plans for the entire exchange be prepared before reaching a final decision on the over-all exchange cable design.

I have geared most of these remarks to your exchange problems. The toll plant problem is probably of least concern to you — and rightly so — your largest investment is in your exchange plant, where you also experience your greatest activity.

The toll problem is nevertheless important and should not be overlooked when making your future plans. The same general principles apply to toll as to exchange:

(1) Rather than make a Commercial forecast of lines and stations — you make a point-to-point toll traffic study.

(2) Rather than establish feeder routes — you determine toll main routes and toll alternate routes.

(3) Rather than select a cable size — you select either toll open wire, carrier, cable or microwave facilities and your carrier selection is most important. So many times a single channel carrier is installed when a multi-channel system should be initially installed by first

placing only one channel into service and then adding additional channels as needed.

Good Planning Reduces Costs

WHY DO I make such an issue of proper planning? During the last 10 years I have engineered projects, supervised engineering projects, and I have acted on the part of management on over-all plant and general problems. During this period I have observed the engineering work and projects in a number of companies — and would make a very conservative estimate that a savings of at least 10 to 15 percent could be realized by *good, sound planning.*

During 1956 Independent telephone companies added over 300 million dollars to their plant investment. If we could have realized as small a savings as 5 percent due to good planning, we would have *saved* the annual charges on 15 million dollars.

This amount of savings justifies a lot of serious thinking and I earnestly recommend that you add good planning to your outside plant program.

Sound planning —in addition to a probable savings in dollars — will: (1) Provide you with adequate facilities when needed; (2) improve the grade of service you render; (3) increase the stability of your financial position; and (4) improve the relationship between your company and your subscribers, your company and your investors, and your company and your State Commission.

We are obligated to our subscribers, our investors and the regulatory bodies to not only plan our programs well, but to construct the operating and distributing plant to the best of our ability — always taking advantage of technological improvements and advancements in methods, materials and tools.

Standard Specifications

DURING THE past several years, the USITA Plant Committee and a number of the larger companies have attempted to standardize on materials. Just a few weeks ago, I attended a meeting in Washington, D. C. with representatives of wire and cable manufacturers, REA engineering personnel and members of the USITA. This was our second meeting, and from these meetings we hope will come sets of standard specifications for covered wire and plastic cable.

These specifications will greatly reduce the vast numbers of wire types, types of insulation, differences in performance characteristics, etc. The end result will give the telephone industry standard products with improved performance, a good possibility of reduced material cost and will permit the use of more standard installation practices.

Considerable difficulty has been experienced as the result of an apparent disregard of installation instructions. Wire, cable, spinning wire, P-clamps, and all types of materials are designed for specific purposes with definite physical limitations. Wire sag tables, tension charts, pole span tables and other such limiting data are designed to accomplish the maximum performance for the respective materials. Road and power clearance tables must be followed to insure safety to the public and to our employes.

Probably one of the most common violations is the

WE SELL our service in our own communities for a small monthly rate — yet any telephone in any of our areas can reach practically any telephone in the world in a matter of a few second or a few minutes. We are, therefore, obligated to the entire telephone industry to insure good, dependable and acceptable service.

use of 25-foot poles for distribution plant and the use of 30-foot poles for joint construction. You may say that you are aware of this — but — are your people building plants in that manner? I suggest that you look over your plant and I think you will be surprised.

Quite often the wire manufacturers are criticized for trouble in drop wire. I have actually inspected damaged drop wire which came from spans as long as 350 feet and from shorter spans where the wire was drawn tight. No insulation or attaching hardware is designed to stand up under these conditions, and I recommend that you follow the principles which are prescribed for the materials you use.

Materials and Tools

PRESENT DAY advancements in techniques and improvements in materials and tools are being brought to our attention almost weekly. Our task is to keep abreast of these changes and take full advantage of them. A few of these changes are described below:

(1) Use of Buried Wire and Cable: Improvements in the wire and cable to be buried and the design of plowing equipment for exclusive wire and cable use has greatly influenced the trend towards more use of this type of plant. One of the larger companies reports actual inplace costs of $.07 per foot for wire — including all overhead charges.

(2) Use of Front-Mounted Derricks and Diggers: The use of this type of equipment is somewhat controversial in some companies. I believe that most of the opponents to the idea, however, have been influenced by disappointing experiences — mainly, breakdown of equipment and expensive repair bills. I have discussed this with several experienced plant men and they can save money using the equipment — even when the high maintenance cost is considered. We have also raised this

question with the truck and equipment manufacturers and I am quite sure that this problem will be reduced in the near future.

(3) Use of One-Man Splicing Crew: A number of companies are performing certain specific splicing assignments with a one-man crew. The use of modern testing equipment greatly facilitates this practice. I can foresee splicers working alone just as do installers, repairmen or linemen — with assistance being given as required.

(4) Use of Fuseless Protectors: The current trend leans towards the use of fuseless protectors where approved. I am sure you are aware of the savings that can be realized in this manner.

(5) Use of Stapling Machines: Stapling machines are used quite generally in the larger companies. There are still a great number of the smaller companies which do not furnish this type of tool. Standard materials are conducive to the use of this machine and I feel that serious consideration should be given to its use where practical.

Plant Maintenance

WE ARE further obligated to adequately maintain the plant to provide dependable and satisfactory service to our subscribers. The better our service — the more valuable it is to our subscribers. Good service is a sure method of selling your company to the community — and — this also helps sell the company to your Regulatory Commission. Many rate cases are settled only after satisfactory service is assured.

Service — and service alone — is the only thing we have for sale. This service can be no better than the condition of the plant over which the service is being rendered. You may have a surplus of switchboard positions — a surplus in toll circuits — a surplus in cable facilities — but — if any one of these is of inferior quality — your service suffers.

OUR MAINTENANCE problem is one of joint responsibility — employes and management. We cannot expect to do a good job if we do not furnish proper tools — mental as well as physical. Given these tools of workmanship, the employe then is responsible for providing an acceptable job.

No circuit is any better than the poorest section of it. This could be a piece of poor inside wire — a one- or two-foot piece of drop wire — a defective cable pair — a poor connection on the main frame — or a defective plug or jack in the switchboard — or a defective contact in an automatic switch. The best toll circuit in the country cannot transmit a good message through defective exchange facilities.

Quite often, we are concerned with our own little area or company and do not recognize the part each company plays in our world-wide telephone system. We sell our service in our own communities for a small monthly rate, yet any telephone in any of our areas can reach practically any telephone in the world in a matter of a few seconds or minutes. We are, therefore, obligated to the entire telephone industry to insure good, dependable and acceptable service.

Our maintenance problem is one of joint responsibility — the employe — and the management. We cannot expect the employe to do a good job if we do not furnish the proper tools — mental as well as physical. Given these tools of workmanship, the employe then is responsible for providing an acceptable job.

I would like to review two examples of maintenance. You can then be the judges of selecting the method you prefer.

FIRST CASE: — Several cases of trouble had been reported on a business telephone and the owner of the business was not too happy. The line card was checked and it was found that three cases of trouble had been cleared within a week and no one had investigated. The testman should have questioned the repairman on the second visit. This was not done then, nor was it done on the third visit.

The plant supervisor personally checked the premises after repeated complaints from the owner. Much to his embarrassment he found this: — bad inside wire — frayed cord on the instrument — loose connection at the protector — badly frayed drop — worn insulation at the building attachment. All of this was found after the premises had been visited three times and the trouble OK'd after each visit.

SECOND CASE: — An exchange was being converted to automatic, involving the addition of 6000 dials on blanked instruments and the installation of 3000 new instruments. The conversion crew was briefed and was instructed to *completely* routine all equipment on the premises including the drop. This was done on all stations and replacements of defective parts were made at the time.

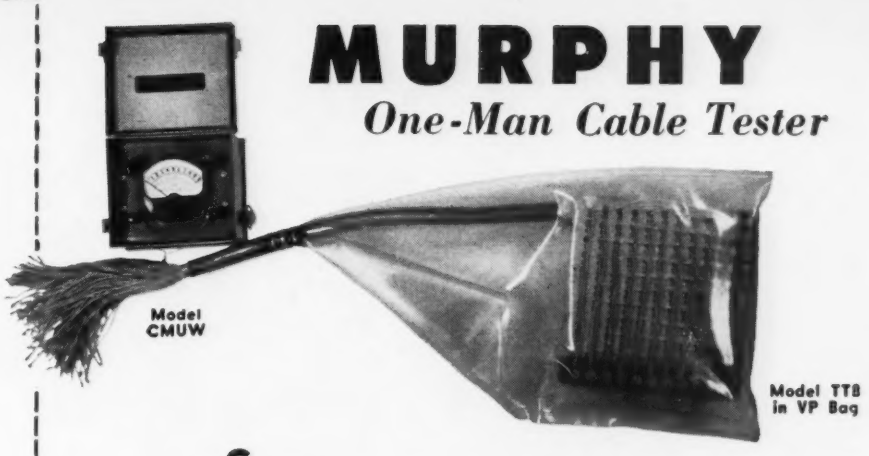
A record had been kept of station equipment and wiring trouble for one year preceding the conversion and compared with the record for a one-year period following the conversion. Within 60 days after the conversion, the number of station troubles had been reduced — on a monthly average — to the equivalent of 1½ man's time. This performance continued throughout the study.

This convinced that company of the value of *completely* repairing trouble versus the "rush" and incomplete method. Repeat visits cost you money — cost you valuable time — and most important — costs you quality of service.

The quality of service should be just as good after

One Man
Working Alone
Can Identify
Non-Working
Cable Pairs
3 Times Faster
Than 2 Men
Working Together
If He Uses
The Murphy
ONE-MAN
Cable Tester

MURPHY
One-Man Cable Tester



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a case of trouble as it was when it was initially installed.

Your subscribers are entitled to good service — *all* of the time — and we are the only persons who can give it to them.

I sincerely recommend that all plant, whether it be open wire — cable — poles — station equipment — or central office equipment, be completely routined before the work operation is reported completed.

Construction Expenditures

REFERRING again to the 300 million dollars Independent telephone companies added to their capital accounts in 1956. Was all of that money spent wisely? Let's assume the plant was properly engineered. About 200 million dollars was spent on outside plant — of which about 100 million dollars was for labor.

Based on results over the last several years, we have found that a reduction in construction expenditures of 5 to 10 percent can be realized by knowing these facts: (1) What kind of a job we are doing, and (2) how we are performing the work.

After these results have been reviewed, corrective steps should be taken to insure maximum efficiency. The productive results should not alone be measured. Improvement in quantity should not be made at the expense of the quality of workmanship.

This same philosophy should be applied to the millions of dollars that are spent on maintenance each year. Improved trouble-clearing practices which usually reduce the clearing time are of no avail if the number of trouble cases are not reduced. Our objective should be the reduction of trouble by the completion of a more thorough job — one that will stay cleared.

The subscriber is paying for dependable service *all* of the time. Our job is to provide dependable — satisfactory — and economical communications service at all times — day and night. *We can not prosper and give poor service.*

All of us have an obligation and a responsibility — to our subscribers — to our regulatory bodies — to our investors — and to our employes. We are responsible for: designing plant; building plant; maintaining plant, and maintaining good service.

We must: Plan our work wisely; execute our plans efficiently, and take care of our plant proudly.

We will then serve well and prosper accordingly.— *Adapted from a paper presented by Mr. Driggs at the* 1957 *convention of the Illinois Telephone Association.*

Worth Writing For

"*Wiremold Telephone Installation Data Sheet.* A new Data Sheet, H7, has been developed by The Wiremold Co., Dept. TE&M, Hartford 10, Conn. giving details and illustrations on the use of No. 1500 and No. 2600 Pancake metal overfloor duct with a few simple fittings for telephone installations at island desks and tables in offices and commercial buildings. For a free copy of Data Sheet H7 write to the Advertising Department. . . . "A Guide For Selecting an Engineering Company." Practical advice on the selection of an engineering firm is available in a new brochure offered by Teller Company, Dept. TE&M, Butler, Pa.

"Only people — individual people — working as a team can get the work done."

"Balanced Training Program" — A Cure For Plant Personnel Problems

By T. DeWITT TALMAGE*

JUST AS EACH individual is a walking advertisement for the company he represents, so, too, is each sub-foreman, foreman, or other class of supervisor a practicing personnel man — and locating and choosing new workers is an integral part of his job. (Part One of this article appeared in the June 15th issue.)

Key To Success: People

IT'S NOT UNUSUAL to get so engrossed in details of immediate tasks that sight is lost of essential, overall considerations. One of these fundamental, unchanging elements that we cannot ever afford to forget revolves around the question: *how does the work get done?*

If we stop to think about it, it is appreciated that no corporation ever raised a dollar of capital funds; no manufacturer ever assembled a telephone instrument; no company ever made a telephone switchboard; and, likewise, no co-operative or any other type of organization ever purchased and constructed a telephone system: only *people* — individual *people* — working as a team can do these things!

As good as the teamwork has been in the past between people making up over 4,000 separate telephone operating organizations, and telephone manufacturing, consulting engineering, and construction contracting companies, further growth and improvement will require equal, if not greater, teamwork in the future.

Because of this elemental fact, promotions of existing employes based on merit and fitness as well as the hiring of new, properly qualified workers should be done carefully with an eye to the future as well as the present.

Educational Manager, Kellogg Switchboard and Supply Company, Chicago 38, Illinois.

In this type of personnel work there is no place for hasty judgments because it is these people who, from then on, will actually make up the team upon which each community will have to depend for its telephone service. It is, furthermore, these same people who will be responsible to the owners of the business for doing their part in making a creditable showing at the end of each fiscal year.

Why make such an issue of this matter of people at this time? Especially since it appears on the surface that with the expected yearly average increase of nearly 3 million persons, the problem of manpower would automatically solve itself.

Here is where a paradox confronts us chiefly because technology expansion has added a new dimension to our manpower problem — the *quality* of our labor force. The experts estimate that our 1967 labor supply will be adequate numerically. However, there is some concern whether the individuals in our labor force will be qualified to perform the various grades of work which will be required. Quality, not quantity, is the principal matter in question at this time.

In any event, the work must go on and the gaps in the ranks of workers must be filled in one way or another. Furthermore, for better or for worse, just as each individual is a walking advertisement for the company he represents, so, too, is each sub-foreman, foreman, or other class of supervisor a practicing personnel man. As such, locating and choosing new workers is an integral part of his job in varying degrees. The thoroughness of methods used in such critical work is important from a dollar and cents standpoint because these decisions can be as profitable or as expensive as the soundness of judgment exercised.

Interviewing Is Important

EMPLOYMENT interviews have been likened to trying to judge the size and shape of an iceberg merely by what shows above water. Eight-ninths of an iceberg is under water. It is this "hidden" eight-ninths of the applicant's present and potential ability that should be discovered and considered when "sizing up" additions to the payroll.

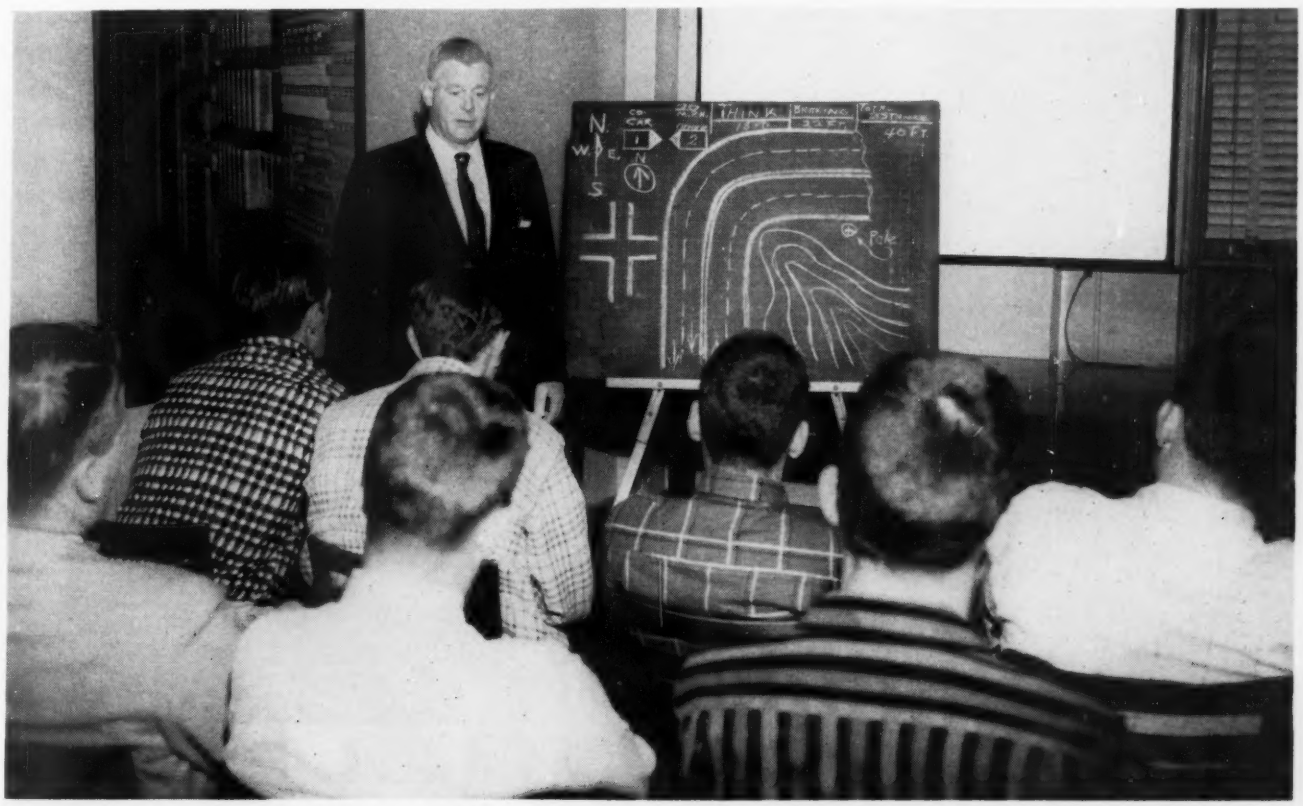
In passing, it might be well for the interviewer to keep in mind that at the same time the alert applicant is being evaluated, he might be simultaneously appraising the interviewer and, through him, the company he represents.

This part of the hiring process should include, among other things, an attempt to determine the prospective worker's ability to systematically learn the work. This characteristic is sometimes called the worker's "trainability." Often the capacity for learning new things is, everything else being equal, the deciding factor in fitting the man to the job.

One of the biggest bottlenecks to overcome is the minds of men who have not increased their ability to *read* and absorb the new information that's essential to handling different, more advanced, or complicated jobs. Down-to-earth, fruitful interviewing should include an attempt to spot such characteristics while there is still time to do something about it.

Advantages To Be Gained

SUMMARY of the practical advantages to be gained by avoiding jumping to conclusions about the fitness of a prospective worker is contained in the new 103-page pamphlet entitled: "Employment Interviewing," recently made available by the United States Gov-



"IT IS ONE thing to employ desirable workers, but it is another thing to maintain their initial interest and encourage progressive improvement in their usefulness. An organized method of training helps to bridge the gap . . ."

Did you know there are

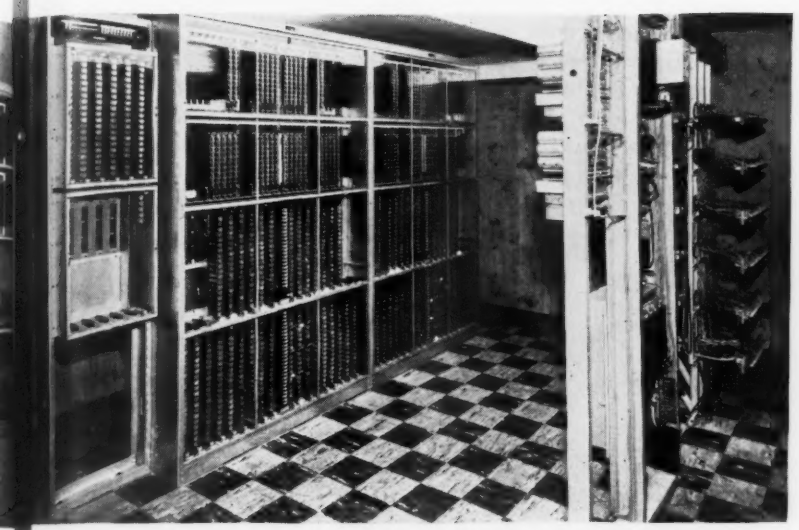
46 Leich Dial Systems in

Le Claire, Iowa

LEICH

A MEMBER OF THE GENERAL TELEPHONE SYSTEM — ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

in Iowa?



Sloan, Iowa

The first Leich Dial System was installed in Iowa in 1948. Installation has followed installation until today there are 46 exchanges using Leich Dial Systems.

Here's why these Iowa exchanges have decided Leich was the best bet for fast, profitable conversion to dial switching.

For example, the Leich Dial System is economical. It's an all-relay dial switchboard. It eliminates elaborate mechanical switching mechanisms that wear and require adjustment. Maintenance costs stay low.

Expansion is easy. Your own switchboard man can jack-in 10 lines in 15 seconds. You don't have to pay for factory installers, soldering, and wiring. The only expense is the cost of the equipment you add — only $172.90 for a 10 line relay bar.

Write for the Leich Dial System catalog which gives you the complete story. Ask for a quotation if you wish. There's no obligation.

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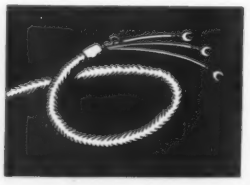


QUALITY CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

ernment Printing Office. The heart of this pamphlet is the recommended conduct of interviewing applicants for a job and evaluating their qualifications.

It can serve as a check list to use while interviewing people so that important points are not overlooked.

It is seldom that any one publication on a subject satisfies everyone. Therefore, it is gratifying to note that a helpful appendix is included in "Employment Interviewing" which contains a bibliography of references to 43 other sources discussing important phases of how to interview job applicants.

Now, an obvious truth: being employed by a successful company does not guarantee that each worker will be a success in his job. A famous baseball player once said: "Catching a fly ball is a pleasure. Knowing what to do with it is a business." A somewhat analogous situation is encountered when a man has landed a new job. The acid test comes when he must demonstrate that he knows what to do about it.

However, it's not *all* up to the new worker to prove good faith any more than it's *all* up to the employer.

The new worker is expected to deliver a day's work for a day's pay just as rapidly as he can "learn the ropes." The employer, in turn, has an obligation to clearly explain the worker's duties to him as well as to do a reasonable amount of instructing in the specialized aspects. To be completely successful, it must be a mutually-profitable, two-way street. Neither can shirk his responsibilities without adversely affecting the other.

Most men do not need to be put under pressure to get the job done correctly and on schedule if their *interest* and *enthusiasm* can be aroused and enlisted on behalf of the aims of their work and the welfare of the company.

It is one thing to employ desirable workers, but it is another thing to maintain their initial interest and encourage progressive improvement in their usefulness. An organized method of training helps to bridge this gap.

To be most effective, training involves more than just instruction and practice on the job in actual work methods. Complete training includes related instruction in the fundamentals of the work. And these two parts of the whole program must, of course, be closely coordinated for best results.

Steady Gets It!

IN ORDER not to lose the trainee's interest, training work should be carried on at an even, steady pace — but not too rapidly. Why not too fast? For the same reason that you don't eat a steer at one setting.

In our impatience, we sometimes demand that the people we train for a job devour the whole animal at once. It is easy to overestimate the amount of information that a bewildered newcomer can soak up at one time.

If the tempo is too swift the trainee may get acute mental indigestion, and we are tempted to think he is slow-witted.

It pays to present a new job one step at a time so the new employe can learn each step before going on to the next. He usually isn't familiar enough with the job to make a logical breakdown.

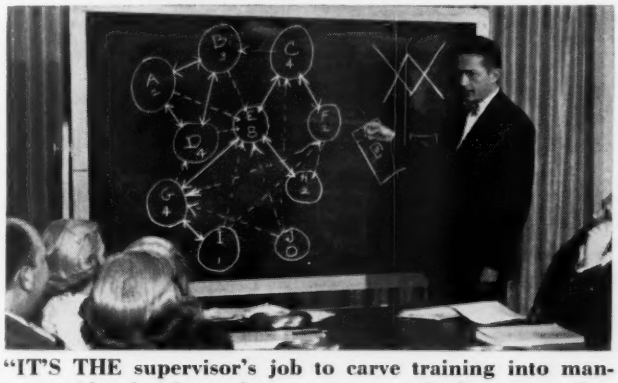
That's where the man's supervisor comes to his

rescue. It's the supervisor's job to carve the instruction into manageable chunks — and serve in an orderly manner.

The new employe can eat that steer — but only one steak at a time — and not too rare!

Training Texts Available

IT WAS WITH the purpose of meeting everyday situations like these that the publisher of those two superbly illustrated training texts entitled "Basic Electricity" and "Basic Electronics," described on page 44 of the April 1st, 1957 issue of the *Telephone Engineer and Management*, has printed the five chapters that make up each book separately in individual volumes in soft covers at a savings of $1.50 per set over all five chapters bound in a single cloth cover. Thus, by purchasing the 10 different paper-bound volumes, con-



"IT'S THE supervisor's job to carve training into manageable chunks and serve in an orderly manner."

stituting the two complete training manuals, a savings of $3.00 can be made plus getting the subjects divided into easy-to-use, chapter-by-chapter sections. These training books are made so lucid by over 1,700 "teaching" pictures that the National Science Teachers Association has said about them: ". . . almost anyone can learn, even by home study."

The Educational Department of this magazine can supply this unique set of ten training texts.

Summary

A BALANCED TRAINING program will do much to offset the shortage of technical workers that is handicapping and, unless conditions change radically, will continue to handicap industries that require men with specialized knowledge and experience.

The advice of that wise Englishman, Rev. Charles Kingsley (1819-1895) applies with equal force today to employe and employer alike: "There are no limitations to what you can do, except the limitations in your mind. Don't think you cannot. Think you can!" — *T. DeWitt Talmage*

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[14] "*Basic Electronics*," (book), 550 pp., 800 illus., by Van Valkenburgh, Nooger & Neville, Inc., 1955. 5 volumes, soft cover $10.00 per set. Cloth bound: all 5 volumes in a single binding, $11.50 per copy. Order from Educational Division, Telephone Engineer Publishing Corp., 7720 North Sheridan Road, Chicago 26. Illinois.

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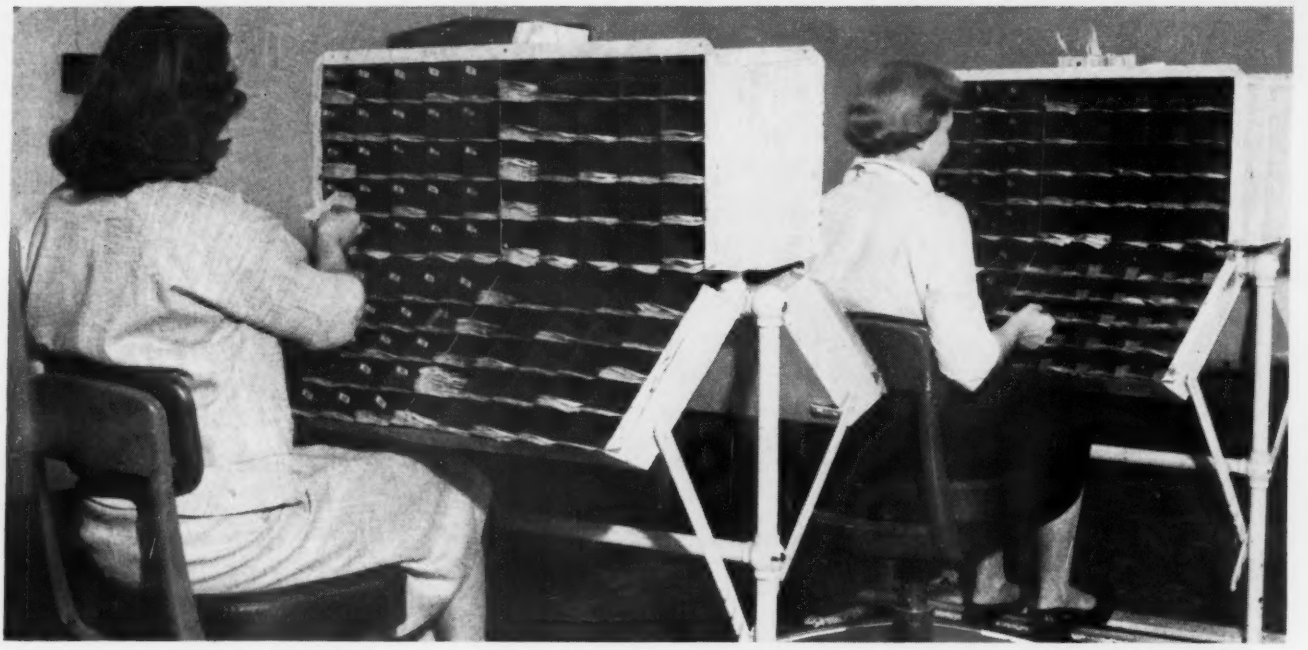


EVERY DAY, up to 3000 toll tickets are sorted into bins, first by exchanges. Next they are sorted by station numbers, first by the last two digits. When next sorted by the first two digits, the tickets naturally fall into station-number sequence.

How Microfilm Bookkeeping

Helps Us Save $4000 Per Year

By ROBERT D. BONNAR

IN September, 1956 the Ashtabula (Ohio) Telephone Co. installed microfilming for toll ticket billing, primarily to relieve an ever-increasing problem of internal bookkeeping. Today, the system has proved in as a goodwill builder and has produced substantial savings in office overhead expenses.

IN SEPTEMBER 1956 our company installed microfilming for toll ticket billing, primarily to relieve an ever-increasing problem of internal bookkeeping. We had read a good deal about the microfilm system in recent years and learned how other Independents had eased their bookkeeping problems as a result. We decided to investigate further.

First we thought it wise to query our PBX customers to get their reaction to the system. About 28 per cent of our toll messages come from 50 of our PBX customers. We had been getting from them a continually growing number of requests for detailed information on this and that toll call. Would these customers object to receiving the actual toll tickets once a month, along with a skeleton statement? Would it benefit or slow up their accounting methods?

The response was practically 100 per cent in favor of the idea. Now, after more than six months the system has been in effect, everyone of our PBX customers is more than pleased with the streamlined method. One big advantage to these customers is the time it saves them in spreading costs within their companies. Previously, each PBX operator had to transcribe this information from her record book to department sheets. Now, she simply sorts toll tickets by departments and forwards them to accounting.

Some of our accounts in groups of three or four use a single business service. To these customers, the returned toll tickets take the mystery out of which company in a group made a specific long distance call.

While our business customers represent a big section of our business, the home installations are equally important. We have received many favorable comments from these customers too. Teenager's parents are particularly pleased. It helps them keep track of all "unnecessary" calls and permits a tighter internal control over the domestic budget.

Saves $4000 *a Year*

SO MUCH for the goodwill factor of photographic toll billing. The microfilming system has produced immediate savings in office overhead. We have realized a reduction of 40 per cent in machine posting time.

TOLL TICKETS are retained in file until the end of the cycle. Filed in sequence, using divider cards the same size for dividers, no further fine sorting is required when the cycle ends when control totalling and microfilming operations take place.

This means we can bill our some 11,000 customers with 1½ less people than was formerly required. At an average hourly rate of $1.30 an hour, this amounts to a saving of more than $4,000 a year.

When studying ways of streamlining our bookkeeping methods, we investigated the punched-card system. We found that for a company of our size — approximately 15,000 stations and 11,000 customers — the cost was prohibitive. In addition, we were already using

THE TOLL TICKETS are microfilmed after the control is established and prior to the billing operation. The Recordak Reliant Microfilmer, with its built-in automatic feeder, photographs the tickets at a rate of 400 a minute. The feeder is so accurate, "missed" images are a rarity. The ratio of reduction of 40 to 1 reproduces the images of 30,000 toll tickets on a 100-foot roll of 16mm film.

AT THE END of each cycle, the tickets are totalled to establish a control balance. Billing is done in three cycles a month. The increase in the number of stations was about to make it necessary to establish four cycles. But the time saved with the microfilming system permits the continual use of three cycles for some time to come.

National Cash 3100 bookkeeping machines and if possible, did not wish to replace them as would have been necessary with the punched-card system.

Under the microfilming system, we learned that our bookkeeping machines could continue to be used. Only a slight revision in the billing forms was necessary. Not only are we using the same machines, but the entire billing job is handled easily on two machines, making the third an auxiliary unit. Eliminating descriptive billing by means of microfilming made this possible.

For a number of years we have been billing in three cycles. At the time we installed microfilming the growth in the number of stations was about to force us into four cycles. Microfilming has reduced billing time so much that we are still able to continue on three cycles.

How the System Works

HERE AT Ashtabula we handle some 70,000 toll tickets a month, an average of seven a customer. From two to three thousand tickets are processed every day. Tickets are sorted into bins, first by exchanges and then by station number. Initial sorting is by last numbers. Then, when resorted again by the first two numbers, they naturally fall in sequence by station numbers. At the end of each cycle the tickets are totalled to establish a control balance.

The microfilming of all the some 23,000 toll tickets in a cycle requires about an hour and a half. Bulk of the time is required to remove and return rubber bands to the batch of tickets for each exchange. All tickets are kept in a file drawer in sequence, using divider cards the same size as the tickets.

We are microfilming at a reduction 40 to 1, using a Recordak Reliant Microfilmer. The duo system of microfilming is used to obtain greatest film economy.

MICROFILMING has reduced posting time by 40 per cent. The system also permitted the continued use of fairly new National Cash 3100 bookkeeping machines. Also, where three machines were formerly required, only two machines do the job, leaving the third as an auxiliary.

ONLY A SLIGHT REVISION in billing forms was necessary to switch to the microfilming system. Tickets are posted first to 3½ x 4 summary sheets. The figures of the station number, each toll call, the tax, and the total are machine entered on the summary sheets.

THE MICROFILMING SYSTEM has produced an unexpected by-product at the customer counter. Toll tickets for all accounts were formally kept in a legal-size file cabinet to answer questions. This cabinet has been eliminated now that the tickets are all on film.

One side of 16mm film on a 100-foot roll is exposed on the first run through the machine. The film is then reversed and the other side of the film exposed. When completed, the single roll of film holds 30,000 toll ticket images.

After the microfilming work is completed, the billing job begins. The tickets are posted first to 3¼ x 4-inch summary sheets. Only the figures of the station number, each toll call, the tax, and total are machine entered on the summary sheets. The name of the customer is not necessary on this sheet because all actual total tickets are stapled to this sheet before it is mailed with the statement.

After this posting, other charges, such as advertising, etc., are rendered by key. The machine then posts the actual bills automatically.

The bill itself is a perforated form, consisting of three stubs. First stub is the bill, second the cashier's stub, and third the accounting stub which is removed before mailing.

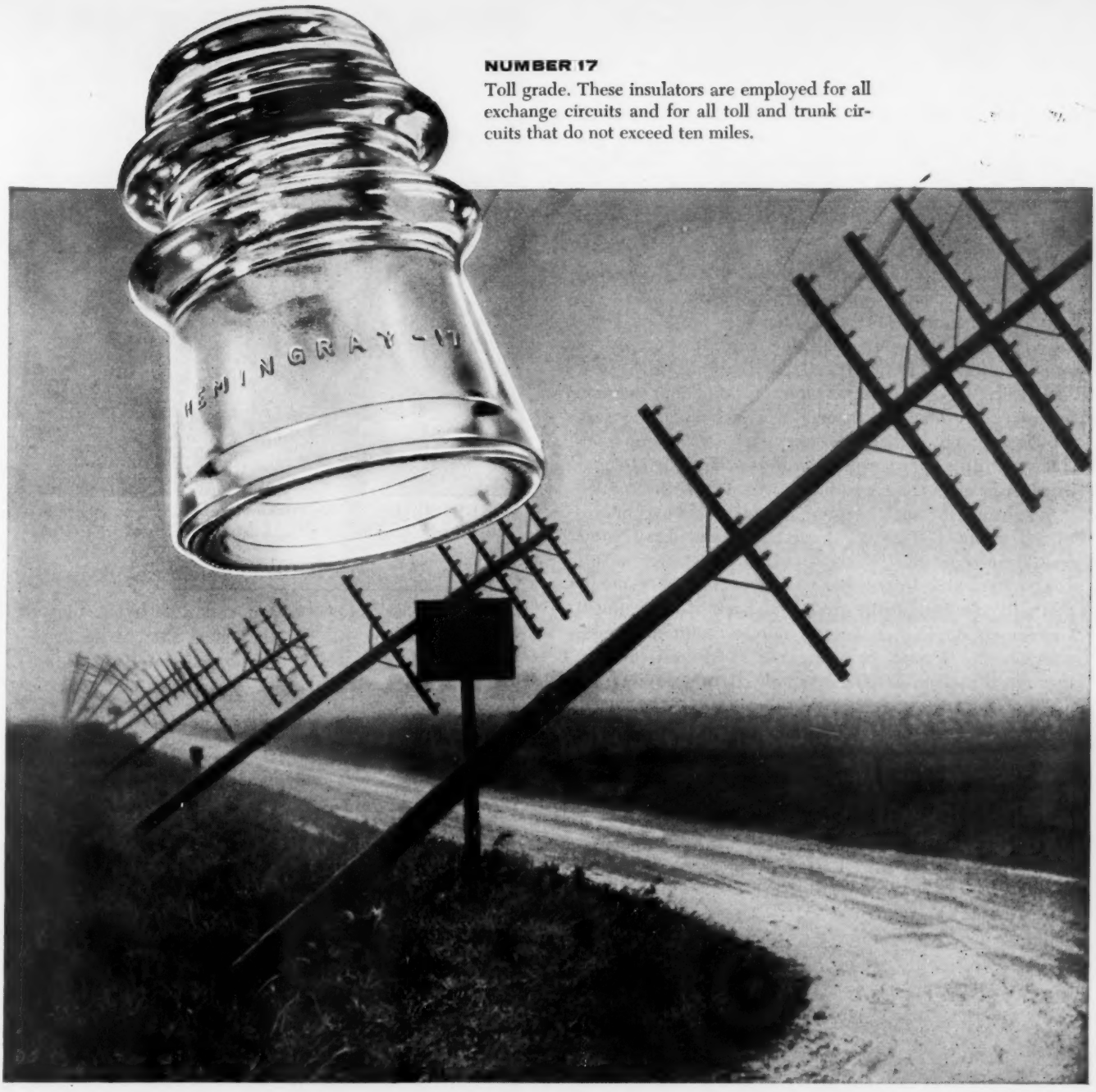
Microfilming Daily Deposits

THE MAJOR purpose for installing the microfilming system was for toll ticket billing. Since then we have come to find microfilming a time saver in other ways. Principal among these is for our daily deposits of customer checks. About 26% of our bills are paid by check, averaging about 125 a day.

Before we started microfilming, it took 1½ hours a day to total the checks and make out the descriptive deposit slip. We formerly entered the name, date, and amount of each check in the deposit register book. By using microfilming, the job is completed in 15 minutes.

A clerk merely totals the checks and enters the num-

THE MICROFILM RECORDS are kept in a film cabinet with the Recordak film reader on top, nearby the cashier windows. Telephone inquiries, greatly reduced now that the customers get the original toll tickets with their bills, can be answered while the customers wait. The need for call backs are considerably reduced.



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ber and total on the deposit slip. The checks are microfilmed along with the adding machine tape. The total is also balanced against the cashier's control total. This little saving alone comes to about $250 a year in man-hours, not to mention the improved morale of the clerk who does the job.

FCC Regulations and Microfilming

AS EVERY telephone operating man knows, FCC regulations (Appendix B, Part 46, Section 46.01, Regulation No. 52349) are quite liberal in the use of microfilm records in lieu of originals. After observing how microfilming works, we have been considering other ways of using this valuable tool for shortcuts in bookkeeping routines and the protection of old records.

Already we have begun microfilming our service record cards. They measure 5 x 7 inches and contain information on both sides. These have taken up considerable filing space, especially those reflecting changes in records of current customers which have been filed in our vault for safe keeping. So far, we have microfilmed about 25,000 of these cards and have some 50,000 more to go.

The Recordak microfilmer we are using is a model that will photograph the front and back of a document simultaneously, which is the duplex method. Consequently, the service record cards need only be run through the machine once. Actually, two separate rolls of film can be exposed at the same time, a fact worth considering if it is desirable to send the extra roll of film of corporate records out of the city for extra protection against disaster. We are also considering the microfilming of cancelled checks — dividend, disbursement, and employe checks. We accumulate about 230 checks every two weeks, or 12,000 a year.

OLD FILE CABINETS for keeping copies of toll tickets are no longer needed.

ROBERT D. BONNAR, Commercial Manager, Ashtabula Telephone Co., Ashtabula, Ohio.

Better Service at Customer Counter

AN INTERESTING and unexpected by-product of the photographic billing system showed up at the customer counter of four cashier windows. All service record cards are filed here for immediate reference when customers paid their bills in person or when they called in on the telephone for explanations of certain charges. Toll tickets for all of these accounts for the previous month were filed nearby in a legal-size letter file cabinet, requiring three full drawers. Now that the tickets are returned with the bills, we have "acquired" three empty file cabinet drawers. This will allow for considerable expansion for service cards.

The rolls of microfilm of toll tickets are retained in a film cabinet convenient to the cashier windows. Telephone inquiries about bills, although greatly less now, can be answered while the customer waits or call-backs can be made within a few minutes. While we still get a few inquiries about customer bills, it almost always pertains to an error in charging a call and not whether a call was actually made.

We have always kept our statement stubs, and are now studying the possibility of microfilming them and throwing them away after six months. Unpaid balances average about 2000 stubs a month. These have been retained indefinitely. However, the FCC regulations authorize a microfilm record of these in lieu of originals.

There has been frequent mention lately over the possible use of automatic machine accounting from the inter-city dial systems. We looked into that angle before inaugurating our microfilming system and could not see how it would ever solve our billing problem. We still need toll tickets to return with our monthly statements.

Perhaps we can someday use the inter-city automatic billing to augment our system, but it would be solely for the purpose of using the tape to run off actual toll tickets. These would then be filed with our other tickets for local stations as a part of our photographic billing system.—*Robert D. Bonnar.*

Illinois Independents Meet

450 Attend 52nd Annual Meeting: W. R. McGrew Elected President

HOLDING their 52nd annual convention at Peoria's Pere Marquette Hotel, members of the Illinois Telephone Association heard speakers R. B. Thomas, R. R. Dobbin, Paul Harvey, B. W. Ford, M. A. Kugler, W. M. Driggs, Hugh A. Barnhart and J. G. Hardy emphasize the growth of the Independent telephone industry and outline ways and means for whipping operating problems of today and the future.

Hugh A. Barnhart, vice president of the United States Independent Telephone Association and president of the Rochester (Ind.) Telephone Co., Inc., told the Illinois telephone group that since the early days of telephony "the Independents have steadily acquired stature, operating vigor and financial stability."

"Today," he said, "there are in the United States and its territories some 4,400 Independent telephone companies serving more than 9,000,000 telephones in some 11,000 communities. These companies today represent an investment of nearly 2.5 billion dollars, have annual gross revenues of approximately $650,000,000, and handle more than 40,000,000 local and long distance calls every 24 hours."

Stating that the Independent telephone companies of America have been an important factor in the retention of the entire telephone industry under the American system of free enterprise, Mr. Barnhart pointed out that the Independent telephone industry owes its progress, its strength, and its vitality to "its allegiance and its adherence for threescore years to its national trade organization — the United States Independent Telephone Association — which has promoted, guarded, and developed the interests of the Independent segment of the industry during most of its remarkable lifetime."

"This year," he said, "one of USITA's foremost activities will be the celebration of its 60th birthday in which we cordially invite every telephone company and every telephone association in these United States and its territories to take an active part. On May 1, a suitable proclamation was issued by President Power designating the week of September 8th 'Independent Telephone Week.' Our President's proclamation was highly embellished and was distributed to all our member companies. Wide publicity has been and will be given to the observance, which offers splendid tie-in opportunities to all units of Independent telephony, including operating companies, manufacturers, suppliers and related firms, state telephone associations like your own, and Pioneer groups.

"As we have pointed out in our Member Letters, many activities can be effectively undertaken to achieve suitable publicity and stimulation of public interest during Independent Telephone Week. These include: open houses by Independent companies, limited number of free long-distance telephone calls and use of voice-recording playbacks at these open houses, appropriate publicity and advertising in local newspapers and company publications, and addresses by company personnel before service

J. G. HARDY (left), secretary, Illinois Telephone Association, Springfield, Ill., discusses Illinois convention with M. A. KUGLER (center) Okaw Commercial Tel. Co., Okawville, Ill., and W. R. McGREW, newly-elected president of the association, Middle States Tel. Co., of Ill., Park Ridge, Ill.

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clubs in Independent territory. Manufacturing members will also participate and a committee of their members will prepare a special exhibit for the Association's annual convention at Chicago next October at which a series of special events will highlight the celebration . . ."

Illinois Association Secretary J. G. Hardy also accented the growth of the telephone industry in his report to the convention.

"In 1928," he reported, "there were 542 telephone companies operating 1,096 exchanges serving 1,771,767 stations. In 1930, the beginning of the depression, we started to lose stations, and in 1933 there were 429 companies serving 1,475,414 stations. In the five-year period from 1928 to 1933, there was a loss of 296,333 telephones. In 1934 there was a small gain in stations and from that year on the growth was steady. By 1946 the gain was from two to three hundred thousand stations each year, but the number of companies continued about the same. As to December 31, 1956, there were 301 telephone companies operating 1,018 exchanges and serving 4,086,246 stations. Of this number the Bell companies were serving 3,458,475 and the Independent companies were serving 627,771 stations."

Mr. Hardy stated that Illinois Independents have converted 297 exchanges serving 324,121 stations to dial. The two Bell companies have converted 165 exchanges to dial serving 3,017,978 stations, making a total of dial stations, both Bell and Independent of 3,342,099, or a gain in stations from 1933 to 1956 of 177%.

ILLINOIS CONVENTION GROUP (l. to r.): — HUGH A. BARNHART, pres., Rochester Tel. Co., Rochester, Ind.; M. A. KUGLER, pres., Okaw Commercial Tel. Co., Okawville, Ill.; R. A. LUMPKIN, pres., Ill. Consolidated Tel. Co., Mattoon, Ill.

The Chief Engineer of the Illinois Commerce Commission, Springfield, R. B. Thomas, also noted and commended the Illinois Independents on their accomplishments in meeting the expanding requirements for telephone service.

Discussing operating problems of small companies, Mr. Thomas emphasized that "this is the most serious problem we in the commission have to face . . . "

"We need your help," he said, "in the reorganization and consolidations which are often the only hope for the salvation of these companies. Some cases are so far gone as to make even this impossible and absorption with larger systems is the only practical answer — The continuance of these

BOARD OF Directors and Guests, Illinois Telephone Association. Seated, l. to r.: K. L. SCHROEDER, vice pres., Northwestern Tel. Co., Freeport; RUSSELL LOGUE, vice pres., C.T.&N. Telephone Co., Casey; C. F. MELICK, pres., Eureka Telephone Co., Eureka; R. A. LUMPKIN, pres., Illinois Consolidated Tel. Co., Mattoon; HUGH A. BARNHART, pres., Rochester Tel. Co., Rochester, Ind.; ROLAND SCHMIDT, mgr., Home Tel. Co., St. Jacob; BURTON W. SAUNDERS, pres., General Tel. Co. of Ill., Sprinfield; DANIEL SCHAEFER, gen. mgr., DeKalb-Ogle Tel. Co., Sycamore; J. G. HARDY, sec., Illinois Telephone Association, Springfield; J. I. KENNEDY, Freeport, Ill. Standing, l. to r.: H. W. PIKE, vice pres., General Tel. Co., of Ill., Springfield; R. C. ROSS, general traffic mgr., General Tel. Co. of Ill., Springfield; W. R. McGREW, district mgr., Middle States Tel. Co. of Ill., Park Ridge; M. A. KUGLER, pres., Okaw Commercial Tel. Co., Okawville; A. T. RENN, general commercial agent, Illinois Bell Tel. Co., Chicago; DON ANDERSON, mgr., Geneseo Tel. Co., Geneseo, Ill.; WALTER DAKIN, chairman of board, General Tel. Co. of Ill., Madison, Wis.; BEN B. BOYNTON, general counsel Illinois Telephone Association, Springfield; GORDON ALLER, general mgr., Illinois Bell Tel. Co., Chicago; DONALDSON COOMBES, connecting company agent, Southwestern Bell Tel. Co., St. Louis, Mo.

problems is a strain on the industry and you as Independent operators, at least equally with Bell, cannot escape responsibility for working toward a solution."

Referring to delays in providing service to applicants in the outlying and sparsely settled portions of exchange areas, Mr. Thomas suggested that "maybe a part of the answer is in a closer adjustment of construction charges to current cost levels."

"And while you are looking at this," he said, "maybe you will find it practical to simplify or eliminate the costly installment bookkeeping you are now doing."

Reporting there "seems to be considerable reluctance on the part of some Independents to move ahead with extended area service, particularly where this involves intercompany arrangements," Mr. Thomas expressed his conviction that customers want extended service where there is high community of interest.

"I am convinced," he said, "that customers want extended local service in lieu of short-haul toll treatment over routes where there is high community of interest. I'm convinced also that, in order to obtain local calling privileges over these routes, the public is willing to pay the higher exchange service charges which the state-wide schedules specify for the larger station counts . . . "

John N. Elliott, general rate engineer, Illinois Bell Telephone Co., Chicago, in his discussion of "extended area service," outlined some of the important factors to be taken into account in reaching a decision as to whether to offer extended area service.

"Once there is some evidence of a definite community of interest between two or more exchanges," he said, "careful consideration must be given to all of the interests which would be affected by offering service on this basis."

He recommended that the following factors be evaluated and activities be undertaken: (1) Studies of message usage between the exchanges involved; (2) customers' expressed desires for extended area service; (3) economic relationships between the exchanges involved; (4) common school districts; (5) the opinion of local telephone people; and (7) revenue effects, rate levies and cost effects.

ILLINOIS CONVENTIONERS (l. to r.): O. A. LOGUE, pres., C.T.&N. Tel. Co., Casey, Ill.; R. B. THOMAS, chief engineer, Illinois Commerce Commission, Springfield, Ill.; W. M. DRIGGS, Engineering Director, General Tel. Corp., New York, N. Y.

R. R. Dobbins, chief engineer, Telecommunications Division, Stromberg-Carlson Co., Rochester, N. Y., told the Illinois Independents "The signs are evident that the telephone industry is entering into the era of full fledged use of electronics."

"As you all recognize," he said, "electronic equipment has been with us in the form of carrier equipment, multiplexing equipment, two-wire, four-wire and negative impedance repeaters and microwave r-f links. Many of you have men on your staff who are familiar with this gear. I feel that the full entrance of the industry into the electronic area occurs when the electronic switching systems start to be used. The immediate future will see this . . . "

Referring to the development of electronic switching systems Mr. Dobbin described a 20-line, four-link system using the straight cross point scheme of space division.

"When you talk through it you are talking through five bilateral transistors;" he said, "There are *no* relays in the whole switchboard. It is approximately one third of the size of the equivalent all relay unit which we market. It uses 600 transistors and 800 diodes. Obviously it is not built mechanically as a production unit. Electrically it will operate over 1000-ohm loop and 5000-ohm leak with pulse speeds up to 40 pulses per second and per cent make ratios from 15 to 80. It is a beautiful example of how it might be done. But, if we were to do it over today we would do it entirely differently. This is the way the art is moving today."

Mr. Dobbin emphasized that the first appearance of electronic switching devices will be in some forms as previously outlined.

"You will not see the complete switching unit in the immediate future," he said, "but you will see the pieces — those pieces which can be proved economically. You must be prepared to accept these pieces as they appear. In this way you will have modern equipment and you will be preparing your personnel for the final transition when it appears."

Pointing out that the important thing to bear in mind is "that this industry is changing rapidly," Mr. Dobbin warned that communication requirements are increasing every day.

"The requirements for faster service and more paths of service are growing so fast that new methods of accomplishing these results must be found," he said. "The telephone company which is going to grow is the one which can quickly adapt to its customer's changing requirements. New services will be developed and demanded. Electronics and electronic switching will have a large part in providing these larger requirements and these new services. Your company can be ready by providing for the use of these newer products as they appear. You will not use them altogether overnight. However, tomorrow always comes sooner than we realize. The smart company will recognize its tomorrow in today's operations . . . "

The new officers of the Illinois Association are: President, W. R. Mc-

Grew, district Manager Middle States Telephone Co., Park Ridge; Vice President, K. L. Schroeder, vice president-general manager, Northwestern Telephone Co., Freeport; Treasurer, Ray J. Alter, general manager, Intra State Telephone Co., Galesburg; Secretary, J. G. Hardy; and General Counsel, Ben B. Boynton, Springfield, Ill.

Directors elected to serve for a period of three years are: Gordon Aller, Illinois Bell Telephone Co., Chicago; Russell Logue, C. T & N Telephone Co., Casey; C. F. Melick, Eureka Telephone Co., Eureka; Daniel Schaefer, DeKalb-Ogle Telephone Co., Sycamore; and Roland Schmidt, Home Telephone Co., St.

Vernon Allan Heads Nebraska Association

VERNON ALLAN, Scottsbluff, Neb., is the new president of the Nebraska Telephone Association, succeeding K. L. Lawson of Lincoln.

Other officers named on the concluding day of the association's 57th annual convention in Lincoln were: C. E. Thompson of Dunning, vice president and F. M. Strasser of Lincoln, acting secretary-treasurer.

The new board members elected by the members were: John E. Kaldenberg of Burwell, Clell D. Elwood of Hay Springs and E. J. Lake of Omaha. They replace John C. Ahlstrand of Omaha, Pat J. Carey of Petersburg and K. L. Lawson of Lincoln.

Earl J. Nelson took over the post of secretary-treasurer on June 1. Nelson is from Webster City, Ia., and will move to the association's permanent Lincoln office.

During final sessions, delegates passed on resolutions. After adjournment Wednesday noon, a Pioneer Luncheon sponsored by the Frank H. Woods chapter, Independent Telephone pioneers of America and Casper E. Yost chapter Telephone Pioneers of America, was held.

John Holman Heads Tel. Assoc. of Canada

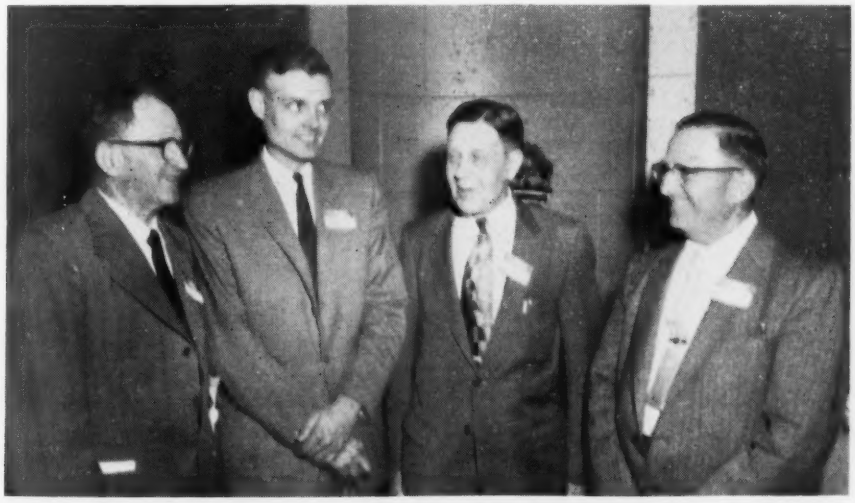
JOHN L. HOLMAN, Saint John, general manager of the New Brunswick Telephone Co. Limited, was elected president of the Telephone Association of Canada at the group's 28th annual meeting at Victoria, B. C.

Holman succeeds S. R. Muirhead of Regina, deputy minister and general manager of Saskatchewan Government Telephones.

Other officers elected were: Vice-president, Winfield S. Pipes of Vancouver, vice-president and general manager, B. C. Telephone Co.; liaison officer, John A. Dochstader of Ottawa, assistant to the president, The Bell Telephone Co. of Canada; secretary-treasurer, William D. Stone of Montreal.

A native of New Brunswick, Holman entered the telephone industry in 1924 as chief clerk in the General Traffic Department of the New Brunswick Telephone Co. Limited, at Saint John.

He became supervisor in 1939; and was appointed general traffic manager three years later. He was a member of the non-permanent active



MEMBERS OF this Illinois Convention Group are (l. to r.): — A. D. HUNTER, mgr., Marseilles Tel. Co., Marseilles, Ill.; P. D. WOODWARD, vice pres., Northern Illinois Tel. Co., Chicago; ED MELCHER, telephone engineer, Illinois Commerce Commission, Springfield, Ill.; OSCAR KRICK, mgr., Millstadt Tel. Co., Millstadt, Ill.

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militia at the outbreak of the Second World War, and became staff officer of signals, Atlantic Command, Halifax, N. S.

In 1942 he went overseas with the 4th Canadian Armoured Division of Signals, serving in France, Holland, Belgium and Germany until V-E Day when he returned to Canada for duty at Ottawa.

Upon discharge in 1945, he returned to the New Brunswick Telephone Co. as general personnel manager. He was appointed general traffic manager in 1949 and was promoted to general manager in 1952. He was appointed to the board of directors of the company in 1955.

Holman is a past secretary-treasurer of the New Brunswick Chapter 51, Telephone Pioneers of America, and a past president of the Associated Alumni of the University of New Brunswick.

Rate Adjustment Granted Ohio Independent Company

THE UNITED Telephone Co., operating 21 exchanges in Logan and Union counties of Ohio, recently received authority to increase its rates.

The local exchange service rates were established by the company on a banding principle with the lowest calling area involved being approximately 591 stations, and the highest calling area approximately 7,514 stations. The percent increase in the various grades of service of the residential classification, which classification has an increase percentagewise of 50 and 57 percent for the rural residence and the one-party residential grades of service respectively, and an average percentage of 65 percent for 5-party.

The average increase of 65 percent for the five-party residential grade of service is due, in part, to the establishment by the company of a .25¢ or .50¢ differential between said grade of service and the rural residential grade of service, whereas, before the rates for both grades of service were the same. The overall effect of the rate adjustment amounts to 32.41 percent on an overall per station basis.

$300,000 Improvement Project Planned at Blakesburg, Ia.

THE Soap Creek Telephone Co. replaced Blakesburg (Ia.) Telephone Co. June 1, as the first step in a $300,000 dial conversion project in the area west of Ottumwa.

Russell Day, who bought Blakesburg telephone exchange five years ago, said a corporation has been formed and an application for a $280,000 loan filed with REA.

Day is president and treasurer and his wife, vice president and secretary of the new corporation.

The expansion plan will increase stations served from 390 to 600.

THE FARMERS Independent Telephone Co., Grantsburg, Wis., recently received the 1000th loan made by the Rural Electrification Administration to improve and extend telephone service in rural areas. Above, signing the $492,000 loan is REA Administrator DAVID A. HAMIL. Behind Mr. Hamil (left to right) are E. C. WEITZELL, chief, Telephone Operations & Loans Division, REA; CLARENCE B. JOHNSON, president, FRANCIS C. NERO, secretary-treasurer, and LEONARD LINDEN, manager, of the Farmers Independent Telephone Co.; Representative ALVIN O'KONSKI, and ARTHUR SCHARTNER, section chief, Telephone Operations and Loans Division, REA.

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Ohio Consolidated Plans Circleville Expansion

CIRCLEVILLE, Ohio, will get a new dial telephone system late next year. It will be part of a $1 million local expansion program announced last month by the Ohio Consolidated Telephone Co.

Initial phase of the expansion program is the construction of a $110,000 addition to the present telephone building. The building program is expected to about double the size of the present structure.

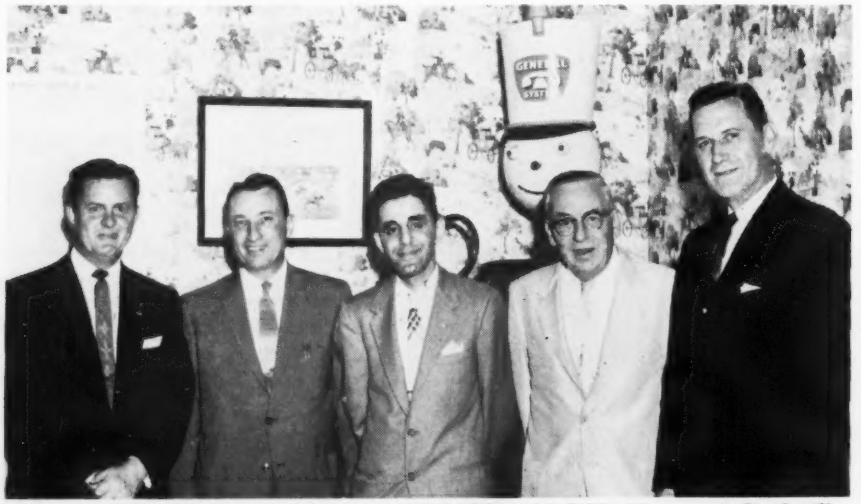
Following completion of the building phase, dial switchboards will be installed and new lines will be laid throughout the city and immediate area. Switchover to dial is slated for the last quarter of 1958. Completion of the building is set for November of this year.

Clare E. Williams, president of Ohio Consolidated, reports that telephone service in the Circleville area has virtually doubled in the last 10 years. There were more than 7,000,000 local calls handled by the Circleville exchange last year. Long distance traffic has increased threefold in the same period he pointed out.

The new switchboard facilities will allow the company to increase the number of terminals from the present 3,527 to about 4,300 next year and a further expansion plan calls for an additional 600 terminals by 1960.

Long distance facilities also will be increased. Presently there are seven long distance operators. The new system will increase that number to 12. Long distance operators will be able to dial most exchanges across the country directly when the switchover is made.

Cost of the total expansion includes $110,000 for the building, about $432,000 for new central office and long distance equipment plus an additional sum for replacing and adding new outside cables, making the total nearly $1 million.



SHOWN ABOVE, left to right, are: ROBERT HEDGES, Mayor of Circleville, Ohio; D. E. McDONALD, president of the Circleville Chamber of Commerce; WILLIAM AMMER, Common Pleas Judge of Pickaway County; PAUL WEILAND, Columbus, Ohio, chief engineer of the Public Utilities Commission of Ohio; and CLARE E. WILLIAMS, Marion, Ohio, president of General Telephone Co. of Ohio and Ohio Consolidated Telephone Co., attending a reception and dinner in which 75 civic, business, and professional leaders of the Circleville area, state, local, government officials, and officials of the two General System Companies were guests of company President Williams.

Tidewater Tel. Announces Two Personnel Changes

TWO organization changes at Tidewater Telephone Co., Warsaw, Va., have been announced by James S. Day, vice-president in charge of operations.

Walter G. Robertson, company vice-president, who in the past has been in charge of division, traffic and commercial activities, will operate in a staff capacity in charge of a public relations program.

In the second change, Lloyd C. Pulley, Jr., traffic manager for the past two years, has been appointed general commercial and traffic manager and will co-ordinate and direct the activities of the two departments.

General Tel. Subsidiaries Start Revised Insurance Plan

ALL OF THE United States subsidiaries and two of the principal Canadian subsidiaries of General Telephone Corp. have put into effect a Revised Life Insurance Plan which will cover approximately 41,000 employes.

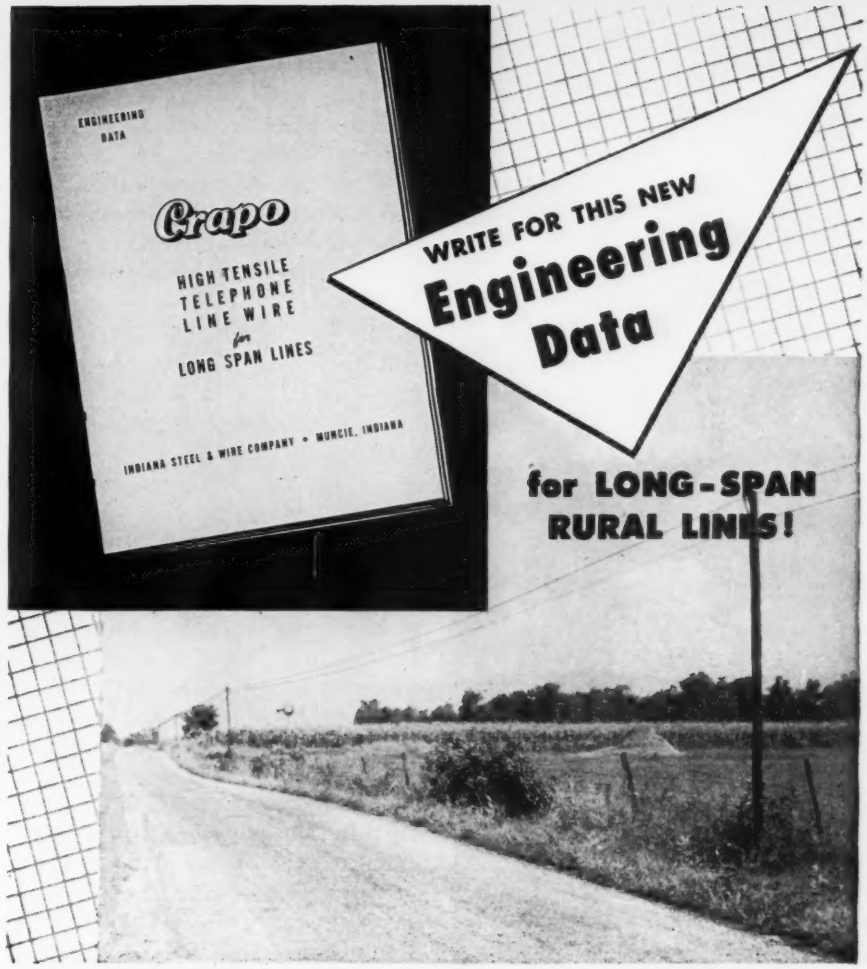
The Plan provides substantial amounts of Free Insurance and also

DAVID E. ALLEN, vice president-sales of Anaconda Wire & Cable Co., has been elected to the board of directors of the company. Mr. Allen joined Anaconda in 1932 as a district sales engineer at Birmingham, Ala. In 1948 he was named assistant chief engineer. In 1950 he was named sales manager and in 1954 he was appointed vice president in charge of sales.

affords the employe an opportunity to supplement his Free Insurance with an additional amount of Contributory Insurance. A provision is made whereby an employe will be granted Free Group Life Insurance after retirement and, in addition, the Plan incorporates Permanent Total Disability Benefits.

Essentially, the Plan provides each employe, after three months of service, Free Group Life Insurance equal to his annual salary or wage increased to the next higher $100 multiple, if not already a multiple of $100. Each employe is further entitled to supplement his Free Insurance by participating in the Contributory Group Life Insurance phase of the Plan. His Contributory Insurance, with some variation, shall be an amount equal to his annual salary or wage increased to the next higher $1,000 multiple, if not already a multiple of $1,000, and for this coverage the employe makes monthly contributions of $.60 per $1,000 of coverage. Thus, an employe can have aggregate Group Life Insurance coverage of approximately two years salary.

The Permanent Total Disability feature of the Plan provides that if an employe, prior to age 60, is found to be permanently and wholly pre-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Engineering Data
for LONG-SPAN RURAL LINES!

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● FEWER pole structures are required where *Crapo* High-Tensile Line Wire is used in building rural telephone lines. This means substantial savings in time, labor and material. There are fewer holes to dig and poles to set, less material to be handled, installed and connected — all of which contribute to lower overall construction costs.

Crapo High-Tensile Line Wire also makes for lower maintenance costs. Its superior tensile strength offers increased resistance to ice and wind loads . . . provides a greater margin of safety. Heavy galvanized coatings assure dependable, lasting protection.

For maximum savings in the construction and maintenance of rural telephone lines, specify the *Crapo* Telephone Wire which best fits your requirements.

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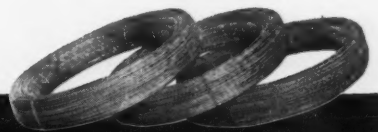

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for executives who like the comfort of a big back and seat of foam rubber over springs
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vented from engaging in any employment his aggregate Group Life Insurance coverage will be paid on an installment basis over the period of such disability or until the aggregate amount of insurance has been exhausted, whichever is the earlier. Any installments remaining unpaid at the death of the employe shall be paid in a single sum to his designated beneficiary.

After retirement, Free Insurance will be carried on a retired employe providing he has had at least 20 years of service, and providing he was carrying at the time of his retirement and had continuously carried Contributory Group Life Insurance. For the first five years after retirement a retired employe will have an amount of insurance equal to 50% of his average annual salary or wage for the 10 consecutive years during which he was paid the greatest salary or wage. Each subsequent year the percentage figure will be reduced 5% until the 10th year when a minimum of 25% shall be maintained for life, but all subject to a minimum of $1,000. In the event the computation of retirement insurance does not equal an even $100 multiple it will be increased to the next higher $100.

Warren Tel. Co. Starts Newton Falls Expansion

THE Warren (Ohio) Telephone Co., started construction work for an addition to the company's existing office at Newton Falls. The $50,000 program is part of the company's program for expanding facilities throughout the area.

Telephone subscribers in the Newton Falls area have increased sharply. In the thirties, there were only 200 subscribers. Today 2,200 telephones are installed in the village with more in demand.

New York Central Names Ritter, Communications Supt.

THE NEW YORK Central Railroad has appointed Leo J. Ritter to the position of superintendent of communications for the New York District with headquarters in New York City.

Ritter graduated with a B. S. in Electrical Engineering from the University of Wyoming in 1946. He was then employed in the General Engineering Department of the Michigan Bell Telephone Co. for approximately a year after which he joined the New York Central and held the positions of communications engineer and electronics engineer prior to his present appointment. He is a member of the U. S. Army Reserve, Signal Corps, with the rank of Captain.

General of S. E. Reports On Stockholders' Meeting

AT THE ANNUAL meeting of shareowners of General Telephone Co. of the Southeast, the following people were elected to the board of directors: Herbert E. Hussey, Gilbert A. Klein, Ernest G. Otey, T. D. Wright, Paul E. Guhl, Gordon Saunders, and Robert J. White.

At the organizational meeting the following officers were elected: Mr. Hussey, president; Mr. Klein, operating vice president; Mr. Hoffman, vice president; Mr. Guhl, secretary and treasurer; Fred Hills, controller; John L. Pittman, assistant controller; G. R. Gish, assistant secretary and assistant treasurer; Miss Helen B. Lloyd, assistant secretary and Miss Dona Lee Smith, assistant treasurer.

New York Commission OK's Spencerport Consolidation

THE NEW YORK Public Service Commission has authorized consolidation of The Hilton Telephone Co., into Ogden Telephone Co. Both firms have their headquarters at Spencerport. The Hilton firm now serves about 1,600 stations in and near Hilton in an area extending from Lake Ontario southerly to the territory served by Ogden Telephone. The present Ogden firm serves about 2,700 stations in and near Spencerport and southerly to North Chili, all in Monroe County.

In connection with the consolidation, the PSC authorized the resulting corporation to issue $350,000 in first mortgage bonds to Berkshire Life Insurance Co., secured by a mortgage indenture to be issued to Genesee Valley Union Trust Co. as trustee.

It is also authorized to issue 800 shares of five percent cumulative $100 par value preferred stock and to issue 7,900 shares of no par value common stock. Of the latter, 3,110 shares are to be exchanged for a like number of existing shares of Ogden Telephone stock and 1,500 will be exchanged for

a like number of outstanding shares of the Hilton company. The balance of 3,290 shares will be offered at $35 a share with existing stockholders of the two companies having preemptive rights to purchase three new shares for each four shares they now hold in either company.

Proceeds from the new financing are to be used to discharge outstanding short-term obligations of the two companies and to defray costs of the consolidation and the issuance of the new securities. The balance is to be earmarked to finance construction work undertaken or completed after the consolidation.

In a report to the Commission, Examiner Thomas J. Brady states that "although the management does not claim there will be any substantial savings in operating expenses as the result thereof, the consolidation should facilitate future financing operations, billing and accounting."

Miss Marion Mountain Joins General of S. E.

DONALD C. POWER, president of General Telephone System, has announced in New York the transfer of Miss Marion Mountain from General Telephone Co. of Calif., where she was personnel administrator, to the Southeastern group of General Telephone operating companies. Miss Mountain's transfer, which is on a loan basis, was effective June 16.

In her new assignment Miss Mountain will assist Robert J. White, director of personnel for General Telephone Co. of the Southeast, in setting up the personnel function in that group of companies. She will be located at the headquarters office in Durham, N. C.

Miss Mountain has had almost 40 years of service with General Telephone Co. of Calif., and its predecessor companies.

Ohio Commission Approves Kingsville Stock Issue

THE OHIO Commission recently authorized the Kingsville Telephone Co. to (1) issue 368 shares of its common capital stock with a par value of $50.00 per share, totaling $18,400 in exchange for its presently issued and outstanding 368 shares of common capital stock with the par value of $25.00 per share; and (2) pay a stock dividend by the issuance of 1,840 shares of common capital

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- **One-piece, permanently-sealed plastic case.** Entire unit is shock-resistant . . . lighter and more compact than glass or rubber.
- **More compact installations.** With smaller dimensions for a given capacity, C & D's take up less battery room space.
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- **Lower costs.** Light plastic case reduces shipping costs . . . total in-place costs.

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Literature available

Write for complete description and specification in C & D PlastiCell Bulletin T-527

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A new feature is a section giving the dimensions of each plier—length of handle, length of cutting knives, width of head, size of point, etc.

This Klein Catalog No. 100 will be of interest to linemen—electricians—good workmen everywhere. A copy should be in the hands of every purchaser of good tools. Write for yours.

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stock with the par value of $50.00 per share, totaling $92,000.00, said shares to be issued, pro ratably, among the present owners of the issued and outstanding shares of common stock.

The company is transferring $101,200 from its earned surplus account to its common stock along with the right to sell for cash 1,500 shares of 6% preferred stock with the par value of $50.00 per share, totaling the sum of $75,000.00, the proceeds of which shall be used to pay its presently outstanding indebtedness and to purchase additional equipment.

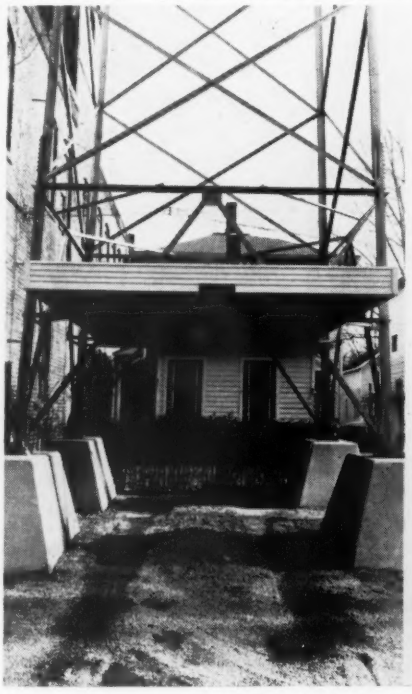
Central Tel. Co. Names Young, Division Mgr.

KENNETH A. YOUNG has been appointed Iowa division manager of the Central Telephone Co. with offices at Fort Dodge.

Young has been acting division manager since the death of Verne B. Clark on March 13. His appointment to the position on a permanent basis was made by Col. L. D. Densmore, vice president and general manager of the Central Telephone Co., Lincoln, Nebr.

The new manager came to Fort Dodge from LaCrosse, Wis., in November, 1954, shortly after the Central company purchased the Fort Dodge Telephone Co. He served as plant manager from that time until Mr. Clark's death.

For five years prior to coming to Fort Dodge, Young was plant manager for the Central Telephone Co.'s western division which included Iowa and four adjacent states. During



"Unusual Carport"

WHAT MAY BE THE ONLY carport of its kind in the world is located in Norwalk, Ohio, where it is part of a modified Type H microwave tower designed and fabricated by Blaw-Knox Co., Pittsburgh, Pa., for the Northern Ohio Telephone Co. Perhaps more important than the carport itself, however, is the fact that towers can be designed to meet most any space requirement. The unique carport is at the base of a 100-foot, self-supporting tower, one of two installed for the telephone company to improve its long distance service for more than 18,000 of the firm's 98,422 customers. The other tower is located 14½ miles away in Willard, Ohio.

With or without the carport the telephone company expects the tower — with a 6-foot wire mesh "dish" — to aid in reducing the cost per circuit mile for toll lines as well as maintenance in an area plagued by heavy sleet "loading." This tower and its Willard companion are capable of supporting additional reflectors.

The Northern Ohio Telephone Company installed microwave equipment while towers, antennas and cable were installed by Radio Construction Co.

Build lines today... FOR TOMORROW

WITH T-C PRESSURE-TREATED POLES

You build for safety and minimum maintenance in future years when you use T-C pressure-treated poles and cross arms.

T-C pressure treatment is sure protection against termites and rot. The T-C process, developed and refined over the past 30 years permits the preservative to penetrate deeper and more uniform — assuring long service life. "Build for Tomorrow . . . specify T-C pressure-treated protection.

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Washington Bureau

(Concluded from page 24)

mon carrier systems, and AT&T opposed broad interconnection of private systems with common carrier networks on the basis that this would lead to "cream-skimming" of the most prospective routes by private interests.

As a measure of the importance of the case to common carriers, Mr. Thayer testified that it has been estimated that "if the facilities we had on radio at the end of 1956 had been furnished by means of wire, the first cost would have been approximately $75,000,000 greater. And if the facilities envisioned by 1967 should have to be provided by wire rather than radio, the additional cost would approximate a half billion dollars, and, of course, in the final analysis, this additional cost would have to be borne by the general public."

Mr. Thayer brought out that "the average cost per telephone circuit mile of Bell System interstate telephone plant was about $72 at the end of 1946, and that this had declined to approximately $51 at the end of 1956." There was only a slight decline from 1946 to 1951, he reported, by "The first telephone circuits were placed on radio relay in 1951 and the percentage has increased from 2% at the end of that year to 22% at the end of 1956. During the same period, the cost per circuit mile dropped to $51."

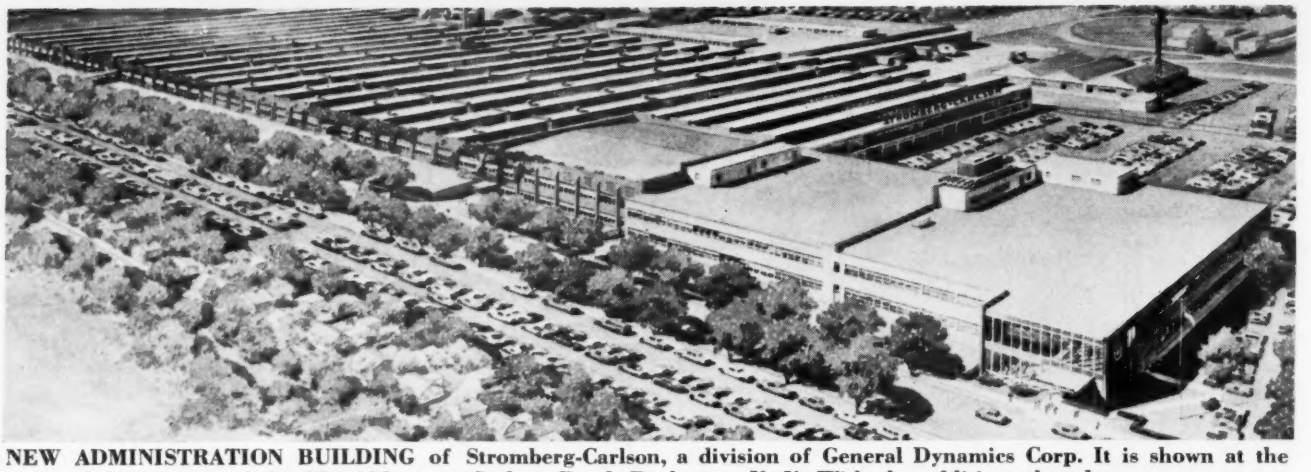
Another AT&T witness, E. T. Lockwood, Assistant Vice President-business relations, declared that the greatest development of private systems would be on "major routes," and that "since common carrier costs tend to be the lowest in the large systems placed in major routes, the introduction of private systems in these routes would tend toward the greatest economic waste."

An exhibit put into the record at FCC request showed that Bell System private line revenues in 1956 were $227,560,000 made up of $100,138,000 telephone, $61,429,000 teletypewriter, $19,931,000 audio program transmission, $35,373,000 video, and $10,689,000 telegraph and other services. The exhibit showed the annual private line total revenues rising steadily from $55,961,000 in 1946, with the component services, other than program transmission, rising in proportion (audio has shown lesser rate of increase, while video has shot up sharply since it was introduced).

New WOC Policy

SECRETARY of Commerce Sinclair Weeks has set forth a policy whereby as the six-month terms of without compensation (WOCs) executives from industry serving as division directors in the Business & Defense Services Administration expire their successors will be appointed from qualified government career personnel.

Beginning July 1, appointments of executives on loan from industry were limited to Administrative Adviser to the Director, Assistant Division Director, Branch Chief, and Consultant.



NEW ADMINISTRATION BUILDING of Stromberg-Carlson, a division of General Dynamics Corp. It is shown at the right of this picture of the Main Plant on Carlson Road, Rochester, N. Y. With the addition, the plant measures one-quarter of a mile long, and provides 800,000 square feet of space. The new Administration Building provides 164,500 square feet for executive, general and telecommunication offices, and cafeteria.

much of his 20 years with the company, he had charge of central office equipment and outside plant operation and engineering in the 53 communities served by Central in northern Iowa and southern Minn.

Stromberg-Carlson Opens New Electronics Center

ON JUNE 11 Stromberg-Carlson formally opened two large ultramodern buildings which more than double its previous facilities in Rochester.

More than one million square feet of additional space is provided in the new Administration Building and the recently purchased "Electronics Center" for the company's rapidly expanding electronics and communications business. Stromberg-Carlson, a division of General Dynamics Corp., is the second largest industry in Rochester, employing approximately 8,000.

Frank Pace, Jr., president of General Dynamics Corp.; Earl D. Johnson, executive vice president, and other top corporation officials participated with Robert C. Tait, president of Stromberg-Carlson, at the official opening.

They met members of the press in the morning, and Rochester industrial and civic leaders and top military officials in the afternoon.

Mr. Tait pointed out that the new facilities greatly enhance Stromberg-Carlson's ability to meet the demands of the electronics and telecommunication fields. Nowhere, he said, is there a building more suited to electronics production requirements than the new Electronics Center, with its large production areas. The opening of Electronics Center frees much-needed space in Main Plant for telecommunication production.

Electronics Center provides 800,000 square feet of space on two floors and a small third floor, and houses the Electronics Division and the Research and Advanced Development Dept. of Stromberg-Carlson.

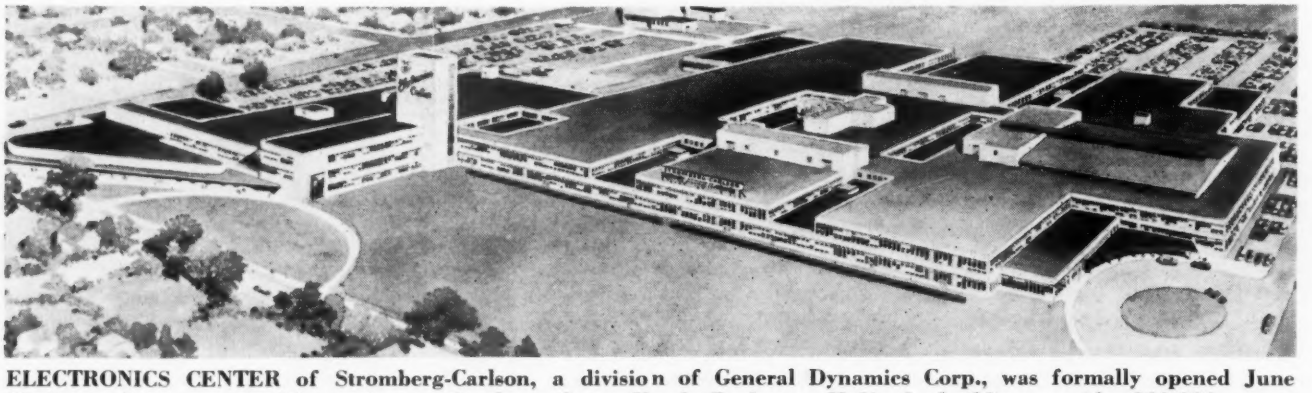
Electronics Center, built in 1948-49 on a 57½ acre site in the northeast section of the city, was purchased from Bond Stores, Inc., late last year. About 35,000 square feet of the building is air conditioned.

The addition to the Main Plant on Carlson Road provides 164,500 square feet of space in the ultramodern Administration Building, and another 110,000 square feet in the new telecommunication factory building.

The new 360-foot long factory building, erected behind the Administration Building and adjacent to the present factory area, is being used by the Telecommunication Division for production of telephone equipment and the "Pagemaster" selective paging system. The use of 60-foot trusses provides large unobstructed areas for the most efficient placement of machines and assembly lines. Vertical window monitors and fluorescent lighting provide an abundance of light.

Manufacturing facilities at the Main Plant are now exclusively devoted to telecommunications, since the Electronics Division has moved to Electronics Center.

Electronics Center is ideal for electronics production because of the large open areas, one of which covers 81,000 square feet. These well-lighted



ELECTRONICS CENTER of Stromberg-Carlson, a division of General Dynamics Corp., was formally opened June 11. Located in a campus-like setting on Goodman Street North, Rochester, N. Y., the building provides 800,000 square feet of space, and houses the company's Electronics Division, Special Products Division, and Research and Advanced Development Department

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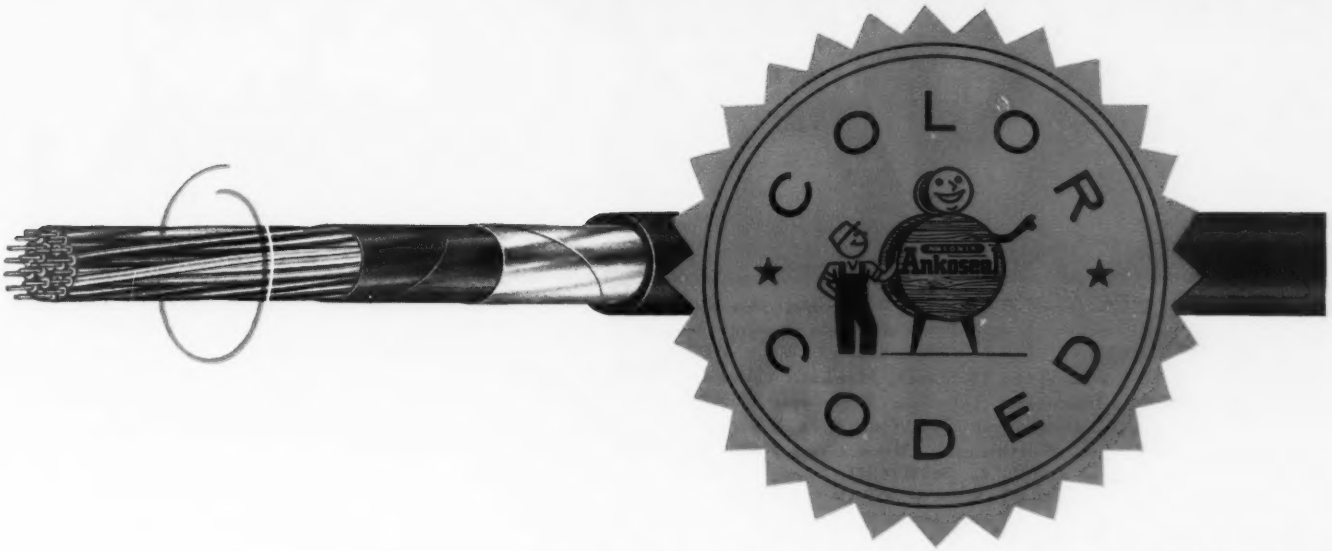

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Now You Can Have Time-Saving, Money-Saving COLOR CODED CABLE with all the famous ANSONIA ANKOSEAL Performance Characteristics Including:

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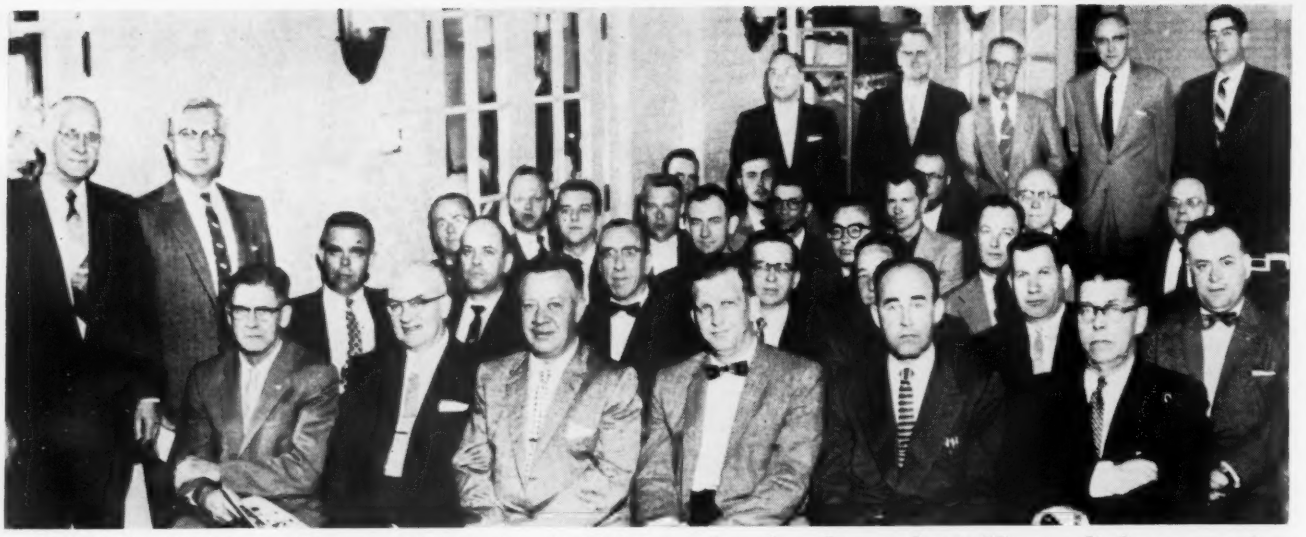
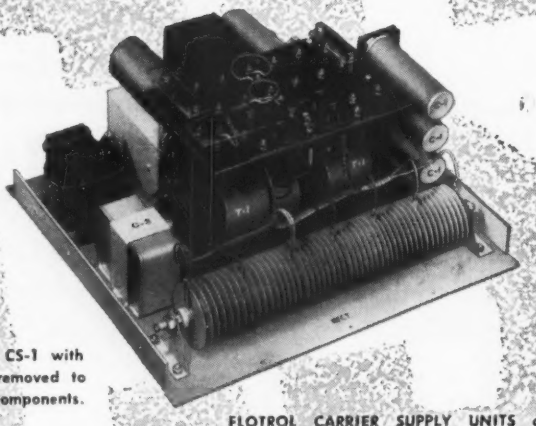


TELEPHONE MEN from Minnesota, Wisconsin, the Dakotas and northern Iowa gather in Minneapolis for a symposium on automatic toll ticketing and direct distance dialing. Seated, from l. to r., front row: K. H. STETSON, R. A. SCHULTZ and JOHN F. REDING, General Tel. Co. of Wis.; KENNETH H. VOLK and A. E. LINDEKUGEL, Central Tel. Co., Fairmont, Minn.; and C. J. ARNOLD, Mankato Citizens Tel. Co., Mankato, Minn. Second row: R. R. HANSON and MARK HOLMES, Minnesota Tel. Co., Minneapolis, Minn; H. R. BOLLINGER, Pioneer Tel. Co., Waconia, Minn.; H. JAMES BOYD, Alexandria Tel. Co., Alexandria, Minn.; CHARLES R. CASHEL and L. A. OSTERFELD, Worthington Tel. Exch. Co., Worthington, Minn.; and JOHN J. NEIDERMAN, Middle States Tel. Co., Des Plaines, Ill. Third row: B. D. MORTON and E. G. NOWICKI, Northwestern Bell Tel. Co., Minneapolis, Minn.; K. A. LARSON, Pioneer Tel. Co., Waconia, Minn.; JAMES P. CLAY, Hutchinson Tel. Co., Hutchison, Minn.; and BARNEY F. RIVERS, Mankato Citizens Tel. Co., Mankato, Minn. Fourth row: JAMES O. DRIVER and DAN L. AULT, United Tel. Co., Monroe, Wis.; HITCH J. HEITMAN and GLENN J. DWELLE, Dwelle Tel. Co., Lake City, Minn.; HUGH N. BARDEN and R. M. RYAN, Northern States Power Co., Minot, N. D. Fifth row: GARTH R. JOHNSON, ARNOLD SCOTT and WALLACE A. GEHRKE, Dickey Rural Tel. Mut. Aid Corp., Ellendale, N. D. Standing foreground: L. L. RUGGLES and F. L. KAHN, Automatic Electric Co., Chicago, Ill. Standing rear: W. T. LAWRENCE and A. G. KRUEGER, Automatic Electric; H. H. BOVEE, Urban Tel. Co., Clintonville, Wis.; A. O. SANDER, Dairyland Tel. Corp., Shawano, Wis.; F. H. SCHAFER, Urban Tel. Co., Clintonville, Wis. This was the first of a series of toll ticketing symposia to be held under Automatic Electric sponsorship during the next 12 months.

FLOTROL Carrier Supply units



Model CS-1 with cover removed to show components.

FLOTROL CARRIER SUPPLY UNITS are designed to supply regulated 130 volt plate current for carrier or repeater operation. The units normally operate from 115 volt 60 cycle single phase power supply, and will automatically transfer to a built-in standby vibrator which operates from the exchange battery upon power interruptions, maintaining uninterrupted plate current during power failures. Regulated voltage is maintained during both normal and standby operation. CS units are housed in attractive light gray steel cabinets, and can be mounted on the wall or in a 19-inch relay rack.

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POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

FLOTROL PARTNERS IN DEPENDABILITY SUB-CYCLE

(Continued from page 70)

areas open off 16-foot wide corridors, which make movement through the building easy. Five elevators facilitate access to the second floor.

An indication of the size of Electronics Center is the large, airy cafeteria, which has a seating capacity of 2,800 persons at one time. There are no supporting columns in the dining area of the cafeteria. Modern equipment has been installed in the kitchen.

In addition to its Rochester plants, Stromberg-Carlson operates two plants in San Diego, Calif., where the Charactron shaped-beam tube, an essential device in air traffic control, is produced. The firm also operates a wholly-owned affiliate, Electronic Control Systems, Inc., in Los Angeles.

Carl R. Traver was the architect of the new Administration Building and telecommunication factory building, and John B. Pike & Son, Inc., the general contractor.

Sprackling Succeeds Keresey As Anaconda President

H. DON KERESEY has been elected chairman of the board of Anaconda Wire & Cable Co., and William E. Sprackling has been elected presi-

dent and chief executive officer. Formerly, Mr. Keresey was president, and Mr. Sprackling executive vice president.

The company also announced the election of Richard B. Steinmetz as executive vice president, David E. Allen as vice president-sales, and the appointment of Vito F. di Lustro as vice president-manufacturing. Re-elected were Fritz L. Meeske, vice president, and Alvin E. Past, secretary-treasurer.

Employes Commemorate Klein's 100th Anniversary

100 YEARS AGO a young iron worker from Germany established his forge in the frontier village of Chicago. This blacksmith shop served also as an evening gathering place for telegraph linemen at a time when communication lines were pushing westward. The tools used were imported from Europe.

One day a lineman broke his pliers and asked Mathias Klein to make a new half. This Klein did, forging it from a bar of the finest tool steel, tempering it, sharpening it and fitting it into place. Several months later the lineman returned with the news that he had broken the other half of the pliers. Mathias Klein then forged the second half and this was the first pair of pliers ever made by Mathias Klein & Sons.

Over the years Klein kept pace with the electrical industry developing tools and safety equipment such as climbers, grips, safety straps, etc.

100 years later, the grandson of the founder and his two sons control the company. Mathias A. Klein is president, Mathias A. Klein, Jr., vice president and secretary, and Richard T. Klein, assistant secretary.

To commemorate this important event, Klein employes, many of whom have been with the company from a third to a half century, designed and made a plaque which was presented to the president. This plaque reads: "1857-1957 To commemorate the 100th anniversary of Mathias Klein & Sons this plaque is presented to Mathias A. Klein, Sr., with respect and gratitude from his faithful employes."

Barrett Forms New Sales Department

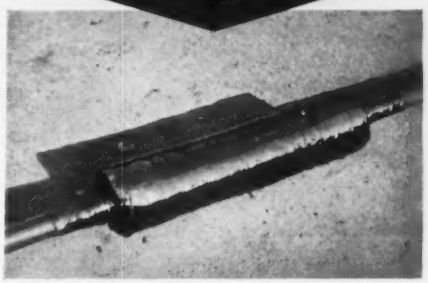
THE FORMATION of an "Industrial Tar Products Sales Department" has been announced by the Barrett Division, Allied Chemical & Dye Corporation.

This department, it is stated, is a consolidation of two separate sales organizations formerly designated as

KLEIN Employes' Committee present plaque commemorating 100th Anniversary of Mathias Klein & Sons to President MATHIAS A. KLEIN. Reading from left to right are: ARTHUR CHROSNIK, WALTER KERKOWSKI, JOSEPH MENZEL, Mr. KLEIN, and NICHOLAS MICHELS.

HIGH-QUALITY PROTECTION AT LOW COST

For PREVENTIVE MAINTENANCE On Conduit, Cable, Etc.



Specify TAPECOAT®

...The Quality Coal Tar Coating in Handy Tape Form

For your preventive maintenance program, you need the best possible protection at the lowest possible cost.

Since 1941, TAPECOAT has proved its superiority in combating corrosion on underground lines, conduit, cable, splices, etc. This quality coal tar coating in handy tape form resists moisture, acids, alkalis, soil stress, electrolysis, chemical fumes, salt water and other severe abrasive and corrosive conditions.

TAPECOAT is self-bonding—simple to apply by spiral wrapping with the use of a torch. No foreign adhesives—no trained help required. Through its high quality and continuing protection, it cuts maintenance and replacement costs.

Low-cost TAPECOAT comes in rolls of 2″, 3″, 4″, 6″, 18″ and 24″ widths—sized to the job.

Write for brochure and prices

The TAPECOAT Company
Originators of Coal Tar Coating in Tape Form

1547 Lyons Street
Evanston, Illinois

Sales and Service Offices in Principal Cities

construction and maintenance DIGEST

- Wires' Shangri-la
- Insure your power
- New small insulator
- Real cool sitting
- Weather-scoffer
- 3 ways better
- Good cable "adds up"
- 5-in-1 protection
- Positive grip
- Water-shed

Published regularly to help you get the most out of your materials and supplies dollar

by Earl A. Roesch, Office Mgr. and Inside Sales–Rochester

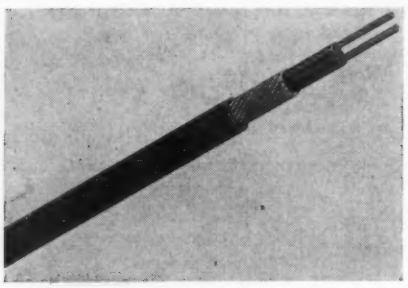
Fishing is a great hobby—but it's poor business. I've noticed this over and over in my 29 years with Stromberg-Carlson. When it comes to selecting supplies and equipment, **smart** men in the telephone industry **don't** fish around. They order direct from Stromberg-Carlson and get the protection of a double guarantee—ours and the maker's. I've seen examples by the thousands of the careful attention paid to your supply needs. It's typical of the company that operates a full-time research program to bring **you** new and better telephone equipment. Your orders help us carry this program forward, faster. That's why we appreciate your business—and why we'll continue to show our thanks by giving you the best service we can.

Here's a drop wire that hides its age

Samples of Whitney Blake Teleprene® (neoprene jacketed) drop wires were strung where they would get lots of weather. After nine years, they still looked fresh and undaunted – and tests showed that these wires would give years and years **more** of good service!

The jacket is a tire-tread type neoprene compound which provides excellent resistance to sunlight, abrasion, oils, acid fumes, alkalies and other corrosive chemicals.

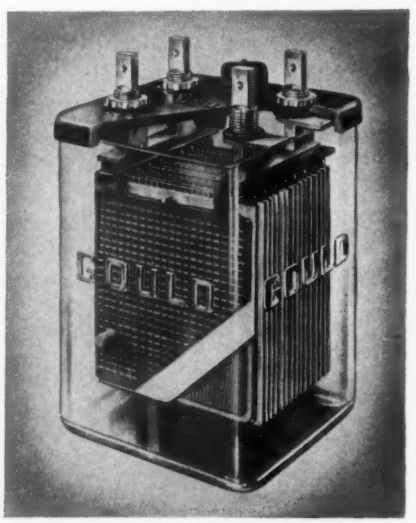
Conductors have Teleplate coating: lead, to resist corrosion, and brass plating over the lead, to provide enduring adherence of the high quality buna rubber insulation to the conductor.



Available in parallel (shown here), twin parallel and twisted pair types.

Insure your power supply

Because Planté batteries practically last forever...providing standby power that never fails...they're the best operating insurance you can buy. In switchgear, signal and alarm systems, or emergency light and power applications, these lead batteries have rolled up amazing performance records . . . are famous for their ability to deliver a powerful surge or a steady flow of current the instant it's needed. Make sure you're in operation . . . always. Choose Gould Planté.

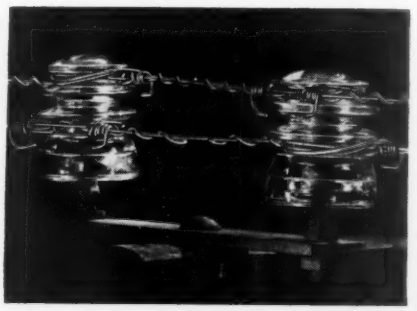


A sure, dependable supply of power when you need it. That, briefly, is the story of this Gould Planté battery.

Your Stromberg-Carlson representative can offer prompt delivery on your order.

Smaller, lighter insulator for point transposition

Weighing almost 25% less than its predecessor, the Hemingray Number 56 insulator has several important advantages. It's grooved just right to hold wire firmly. It's small and easy to install. Requires **no** special hardware, and goes on standard pins.



You'll get years of reliable service from each Hemingray insulator, because they are unaffected by sudden or seasonal temperature changes, do not age or deteriorate. All surfaces are, of course, impervious to moisture.

For faster line work on rural lines, this one-piece insulator can save you installation time, and maintenance costs.

Cane-seat chair keeps operators cool, comfortable

Making the operator as comfortable as possible may not strike you as a "maintenance" problem – yet your service is much smoother when the girls are cool and relaxed.

This operator's chair has a cane seat, which is much cooler, cleaner and more comfortable than other types. It retains all the posture advantages for which Sturgis is famed. It is called the Sturgis SC-240.

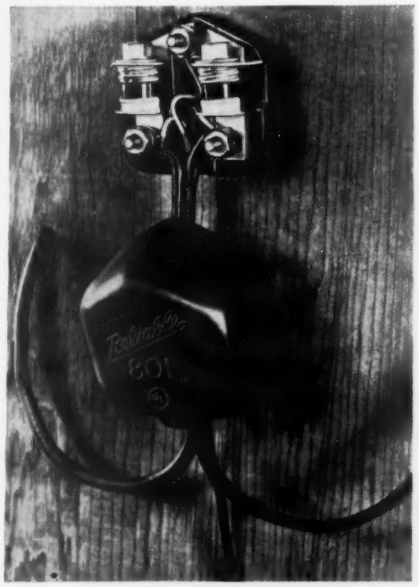
The posture-curved, well-cushioned backrest is covered in genuine leather.

The exclusive Sturgis "Follow-Flex" feature automatically adjusts to the operator's every movement, supports her restfully all the time, discourages fatigue, keeps her at top efficiency.

Other new and welcome features include a plastic-coated steel foot ring which retains its color, and a handy purse holder, available on request. Six seat heights, all adjustable.

Long life under all conditions

You get long service life under all kinds of weather conditions with the Series 800 Fuseless Protector, recently developed by Reliable Electric Company.



Easy to install and maintain

This new protector is available with Reliable No. 504 Protector Units (as No. 801) for station protection and with Reliable No. 506 Protector Units (as No. 801A) for cable protection.

The weather-tight neoprene cover has passed the Underwriters Laboratories severe requirements for performance and weathering under temperature extremes. The protector is listed under UL Re-examination Service.

The neoprene cover fits snugly and drops out of the way conveniently when protector is installed or serviced.

Raytheon Rectricharger® Battery Chargers—Complete Line 3-400 Amperes

Entirely redesigned new Raytheon Rectichargers offer three major improvements:

1. ±1% no-load to full-load stabilization prevents battery overcharging, minimizes gassing, lengthens battery life.

2. No audible hum at output terminals.

3. Most compact units on the market—wall or rack mounted.

New Raytheon battery chargers feature ±1% no-load to full-load regulation

Automatically compensated for rectifier aging, Rectichargers offer high efficiency, completely automatic regulation. No moving parts and self-protecting circuitry assure minimum maintenance, long life. Single and three phase, 3-400 amps.

Built by Raytheon, supplied to you by your Stromberg-Carlson representative.

Copper Wire + Paper Insulating Tape + Lead-Antimony Sheath + Accuracy in every detail adds up to—Kennecott Telephone Cable

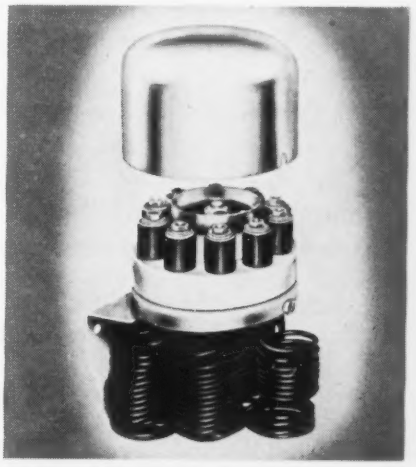
Accuracy in every manufacturing process is the reason Kennecott Telephone Cable is of high quality. Careful manufacture—attention to the minutest details—result in dependable, long-lasting cable performance.

Your Stromberg-Carlson representative can offer prompt delivery on your order.

Protects 5 circuits at low cost

You get low-cost protection for 5 circuits with Cook Electric Company's Hy-Cap Power-Cross Protector—a single compact unit with only one ground wire.

In the assembly of this unit 10 carbon electrodes are fixed to a porcelain base which has a snug-fitting, weatherproof aluminum cover. Each electrode has a fusible element which forms a direct path to ground when an extended discharge occurs. Ten insulated copper wire leads are factory-connected to the protector and cut to correct lengths for installation on a 10B crossarm. Wire entrances are sealed with rubber grommets. A steel bracket makes mounting easy.

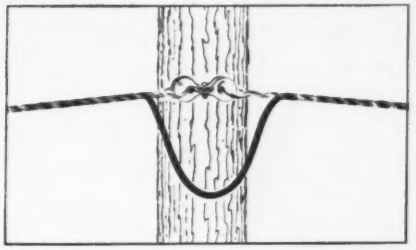


Protect 5 circuits with this one compact unit.

If all 5 wire leads are not needed at installation time, you can leave the extra wires coiled until facilities are increased.

Pressure is widely distributed

To provide an even, positive grip, Preformed Dead-Ends for Self-Supporting Plastic Cable are designed so that low radial pressure is distributed over a large area.



Available for 6, 11, 16 and 26 pair 19 AWG Self-Supporting Cable.

(*Continued on Page* 76)

(*Continued from Page 75*)

construction and maintenance digest

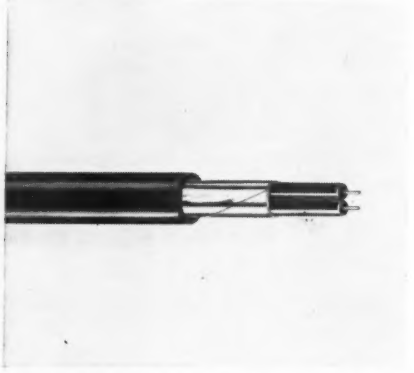
You have no high stress points to worry about, and no sharp bends in the cable are required. PLP Dead-Ends hold the full-rated strength of the Self-Supporting Cable and will not damage the outer covering or internal members.

You can easily apply these Dead-Ends by hand, without tools. Simply insert one leg through a standard hardware thimble clevis and wrap the legs around the cable.

Preformed Dead-Ends are specifically designed for safe use with plastic-covered multiple cable.

B. U. G. Cable—Outstanding Resistance

For outstanding resistance to moisture, acids, oils and chemicals, specify Ansonia Wire & Cable Company's B. U. G. wire, designed specifically for direct earth burial.



Specifically designed for direct earth burial

This wire features two 16 gauge conductors insulated in parallel with polyethylene, shielded with .004" aluminum tape and covered with a tough, waterproof plasticized polyvinyl chloride jacket.

Your Stromberg-Carlson representative is ready to supply them to you.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

"Creosote & Pitch Sales" and "Protective Coating Sales," and is now under the direction of V. C. Otley, Manager.

Barrett's Industrial Tar Products Sales Department will handle the marketing of such basic coal-tar products as creosote oil and solutions — to railroads, other utilities, private and commercial treaters of wood. The distribution of coal-tar pitches, to the aluminum, carbon electrode, fibre conduit, foundry and other industries represents an important part of the department's operations.

Barrett's protective coal-tar coatings, and wrapping such as saturated felts and fabrics, for use on oil, gas and water pipe lines — and its "cold" coatings for industry in general — become the responsibility of the new department.

The address of the Industrial Tar Products Sales Department is at Barrett's headquarters, 40 Rector Street, New York City.

T. W. Krueger Named Duff Norton Sales Mgr.

PROMOTION of T. W. Krueger to sales manager has been announced by the Duff-Norton Co., Pittsburgh, Pa.

Krueger will be in charge of all sales for the Jack and Coffing Hoist Divisions. The position includes responsibility for foreign sales as well as domestic sales to railroads, the government and distributors.

Krueger formerly was sales manager of Duff-Norton's Jack Division, a position he held since January of 1957. He joined the company in 1947 as advertising and sales promotion manager and later served as assistant sales manager.

A. R. Teifeld Elected V. P. Natl. Advertising Association

ALBERT R. TEIFELD, director of advertising and public relations for the Copperweld Steel Co., Pittsburgh, was elected vice-president of the National Industrial Advertisers Association at the annual conference held at the Waldorf-Astoria Hotel in New York last month.

Mr. Teifeld has held many positions with the NIAA. He has served as President of the Pittsburgh Chapter, National Director, and National Chairman of the Association's Business and Public Relations Committee.

ALBERT R. TEIFELD

In 1944 he joined Copperweld as advertising manager and was promoted to his present position in 1953. At one time he was associated with the American Steel & Wire Division of United States Steel.

The NIAA is the country's largest industrial advertising organization. This year, more than 1,000 members from the association's 30 local chapters in the U. S. and Canada attended the annual conference to discuss new techniques in industrial marketing.

C & D Batteries Announces Organizational Changes

LAST MONTH Frank S. Carlile, board chairman of C & D Batteries, Inc., Conshohocken, Pa., announced the election of Louis M. Eble, Jr. as vice president. Mr. Carlile also announced that Stewart E. Doughty has

LOUIS M. EBLE, JR.

S. E. DOUGHTY

been elected treasurer of C & D and that H. Russell Stewart, assistant to the secretary and vice president, marketing, has been named a director.

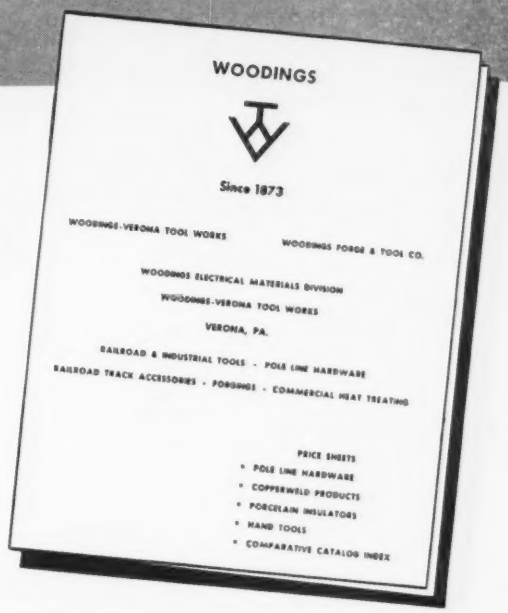
Mr. Eble was graduated from the Pennsylvania State College in 1948 with a degree in Industrial Engineering. He joined Link Belt Co. and worked at its Hunting Park Avenue plant in Philadelphia on plant layout, supervisor training, and material handling.

In 1949, Eble joined C & D Batteries as advertising manager and assistant to the vice president in charge of sales. He was elected a director in 1953.

Mr. Doughty, son of the founder president, succeeds Frank S. Carlile who was elected to the newly-created post of chairman of the board. Carlile and the elder Doughty founded the company, which manufactures in-

H. R. STEWART

Get this FREE price sheet Catalog *on* WOODINGS-VERONA POLE LINE HARDWARE

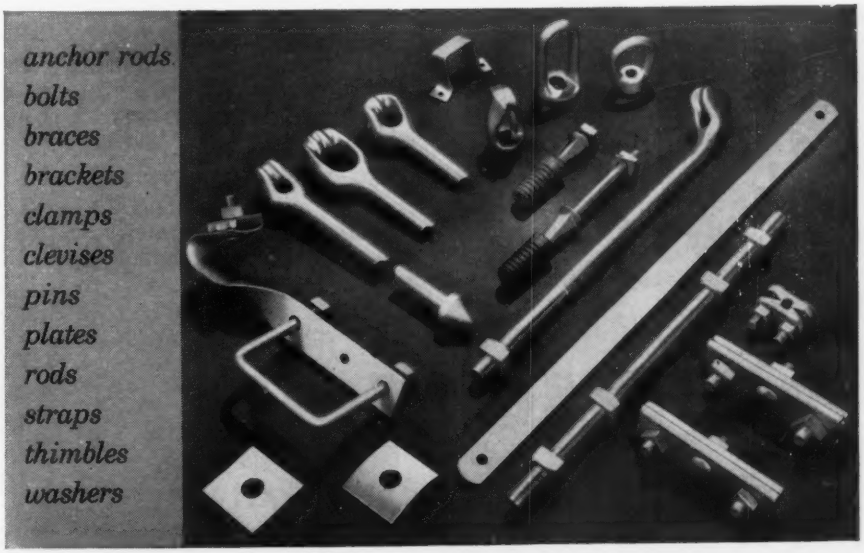


a new single source of supply... saves **TIME** *and* **MONEY**

Descriptive data on Pole Line Hardware, Porcelain Insulators, and Hand Tools are given in this new catalog along with ordering information and prices on available types and sizes. It shows how Woodings-Verona provides you with a dependable source of supply for all your pole line hardware needs. The catalog pages are loose-leaf to assure a handy, up-to-date desk reference for planning pole line construction and maintenance. Write for your personal copy *today!*

Electrical Materials Division

Woodings-Verona Tool Works • Verona, Pa.



BISHOP...

Producer of World Famous

BI-SEAL

(The Electrical Tape With A Memory)

Offers 5 Electrical Tapes for Moisture Sealing, High-Voltage Splicing, Jacketing, Insulation Build-Up, and All-Purpose Taping.

FOR PERMANENT MOISTURE SEALING

Bi-Seal Self-Bonding (polyethylene based) Electrical Tapes. Water absorption as low as .0065%. Operating temperatures range from –55°C. to 85°C. Power factors are .0006 and .0021 for 1000 cycles.

FOR HIGH-VOLTAGE CABLE SPLICING

No. 30 High Voltage Splicing Tape. Developed especially for splicing cables insulated with ozone-resistant compounds and operating at 2000 volts or more. Superior ozone and corona resistance.

FOR PERMANENT CABLE JACKETING

Bi-Prene (neoprene) Jacketing Tape. For splicing neoprene-sheathed cables. Protects against ozone, heat, moisture, sunlight, oil, grease, hydrocarbons and chemicals, particularly acids. Flame resistant.

FOR RAPID INSULATION BUILD-UP

No. 125 Electrical Filler Tape. ⅛" thick insulating compound in tape form. Easy to mold to any shape. Fuses to a solid, flexible mass. For cable splice build-up, covering sharp cornered connectors, padding bus bars, cable end sealing.

FOR GENERAL INSULATING AND JACKETING PURPOSES

Vinyl Electrical Tapes. Thin, tough pressure-sensitive tapes with great adhesive strength. Offer complete electrical and mechanical protection for most general taping problems. Highly elastic. High dielectric strength.

Write for complete catalog information.

MORE THAN A CENTURY OF BISHOP ELECTRICAL INNOVATION

INDEPENDENT

BISHOP

MANUFACTURING CORPORATION

11 Canfield Rd., Cedar Grove, New Jersey

dustrial storage batteries, back in 1906.

The new C & D treasurer attended Temple University and the Drexel Institute of Technology. Prior to his wartime service with the Air Force, Doughty was employed by the Pioneer Instrument Division, Bendix Aviation Industries, in the inspection and quality control sections.

Following World War II, he joined C & D Batteries as chief inspector, and in 1952 became quality control supervisor.

Stewart joined the company in 1949. He was made assistant secretary in December, 1952 and became assistant to the vice president of marketing in April of this year.

Before joining C & D Stewart had been employed by the Insurance Co. of North America.

Stewart attended Germantown High School, Standard Evening High School, and the Navy V-5 program. An accounting major, he was graduated from Lehigh University February, 1949 with a bachelor's degree in business administration.

He also studied at the Wharton School of the University of Pennsylvania, earning his master's degree in business administration in June, 1955 as an industrial management major.

Sydney W. Morrell Joins Int'l. Tel. & Tel.

DIRECTORS of International Telephone & Telegraph Corp. last month elected Sydney W. Morrell vice president in charge of public relations. Morrell, formerly general public relations manager of the Ford Motor Co., succeeds Leonard Jacob II, who is retiring.

Born in England, Mr. Morrell was a reporter with the Daily Herald, Manchester, from 1930 to 1933, and a foreign correspondent of the London Daily Express from 1933 to 1940, being stationed successively in Vienna, Prague, and Budapest, and traveling widely in Europe and the Middle East. From 1941 to 1947 he was on special assignment with Major General William J. Donovan of the American Office of Strategic Services, and with the late Robert E. Sherwood, then head of the overseas branch of the Office of War Information.

From 1947 to 1952, Mr. Morrell had various organizational assign-

ments with the United Nations in Europe and New York. He became an associate of the New York public relations firm of Earl Newsom & Co. in 1950 and a partner in 1951. He has served as general public relations manager of the Ford Motor Co. from 1952 until the present.

Free Service Offered Rotary Drill Users

LAST MONTH Tilden Tool Manufacturing Co. announced production of the Tilden Masonry Drill Starting Guide, which provides a means of precision locating and starting of hole with ease.

The drill guide has guide-holes for drills 1/4" diameter through 1 1/4" diameter, and is simple to use. Ac-

cording to the manufacturer the Tilden Starting Guide is supplied free to users of Tilden Rotary "Konkrete Kore" Drills.

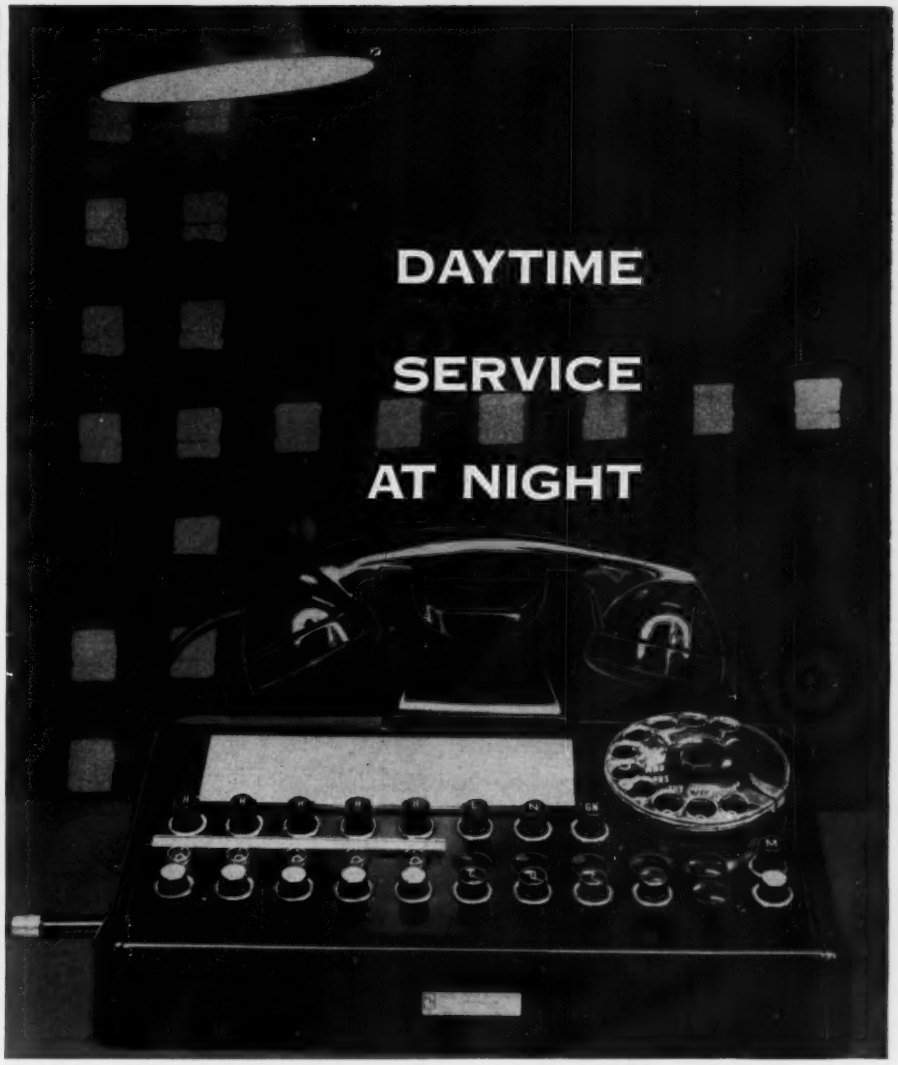
The guides may be obtained from Tilden Distributors or by writing Tilden Tool Manufacturing Co., 209 Los Molinos, (Dept. TEM), San Clemente, Calif., advising size and make of drill being used, and from whom purchased.

Weyers Cave Tel. Exchange Converted To Dial Service

THE WEYERS (Va.) Cave Telephone Exchange was converted to dial system last month and 500 calls were registered during the first half hour.

Among those present were G. Fred Switzer, president of the Harrisonburg Telephone Co., and his brother, Frank Switzer, general superintendent of the company and mayor of Harrisonburg.

The new dial system represents an



...HELPS YOU SELL PBX BY USI

Needs no attendant at PBX! Type 30 PBX night key automatically transfers incoming calls to pre-assigned extensions. Inter-office or outgoing calls are dialed direct! These *standard* USI night service features will work overtime for you in selling subscribers on PBX by USI!

FEATURES YOU LIKE!

Rugged! Gives years of close to zero maintenance!

Compact rotary and rectangular motion switches with twin bifurcated wipers.

Expands in steps to 15 trunks—100 stations.

Parts delivery overnight to most points.

SUBSCRIBERS LIKE!

Automatic connection of incoming calls to extensions with pushbutton transfer gives daytime service at night.

Key senders pulse automatically on larger systems.

Incoming calls stored and put through automatically.

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TELEPHONE PRINTING
By People Who Know the Telephone Business.
See the Suttle Catalog.
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE ILLINOIS

MAINTENANCE-SERVICING GUARANTEED
A newly organized Company ready to serve you.
NATIONAL INSTALLATION SERVICE CO.,
PHILLIPS-STANLEY BUILDING
Room 235, Jasper, Alabama.

What You Want When You Want It
Immediate Shipment from Nearest Warehouse Points
TELEPHONE & POWER SUPPLY, INC.
TOPEKA, KANSAS PHONE 4-8788

investment of $225,000. It serves nearly 500 telephone subscribers.

The Weyers Cave Exchange connects with the entire Harrisonburg system which now has 13 modern dial exchanges serving about 14,750 subscribers. Weyers Cave is the last exchange in the system to go dial.

Conversion to the dial system of the Weyers Cave Telephone Exchange not only marks the end of the use of magneto telephones, but it will also lead to the dissolution of the corporation known as the Weyers Cave Telephone Exchange which was chartered in 1903.

General of Pennsylvania Names Merchandising Mgr.

FRED E. CUNNINGHAM has been named general merchandising manager of General Telephone Co. of Pennsylvania, according to an announcement by Emmett Swanson, operating vice president of the company.

Cunningham, former sales supervisor for the company has had an extensive background of sales experience. In 1935, he became active

FRED E. CUNNINGHAM

in retail food sales. In 1947, he joined General Telephone Directory Co. in Illinois as a sales supervisor and, in 1950, transferred to Pennsylvania in the same capacity. He was appointed general sales supervisor for General Telephone Co. of Pennsylvania in 1955, the position he held until his promotion to the newly-created post of general merchandising manager.

In his new capacity, Cunningham will develop and administer merchandising activities on behalf of General

(Please turn to page 86)

New White 3022 line construction truck is equipped with special body.

A TE&M Service Department

NEW PRODUCTS

This month our New Products' editor introduces: (1) New Klein belt suspenders; (2) a new line construction truck; (3) a self, threading lock nut; (4) a universal, impedance bridge assembly; (5) a new truck crane; (6) a varnished, polyester web tape; and (7) a portable, concrete drilling machine.

New Belt Suspenders

MATHIAS KLEIN & SONS, Chicago, Ill., announces the development of new belt suspenders. The use of these suspenders will assure the safety belt remaining in the proper position and will increase the comfort of the wearer. The weight of the belt is carried over the shoulders and two large shoulder pads distribute this weight for increased comfort.

The suspenders are equipped with four snaps which give four-point suspension, and each strap is provided with a buckle to permit easy adjustment. Made of highest quality harness leather. Catalog No. 5213. For complete information, *Check New Product* 167.

Line Construction Truck

THE NEW White 3022 line construction truck is equipped with a special body designed for use in line construction work. The body has a heated crew compartment and extra space for tools, tackle and supplies. Both winch and pole derrick are provided. The winch is driven off the main five speed transmission. The pole derrick takes its power from an auxiliary transmission.

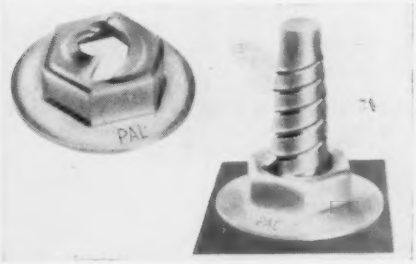
The low step-in height of cab, its roominess and excellent vision make for driver comfort and safety, accommodating larger crew. The power-tilt-forward feature of the cab provides easy access to radiator, motor, clutch and transmission and results in time saving, lower maintenance cost and improved quality of work. The cab tilts forward in 25 seconds.

For complete information, *Check New Product* 168.

Self-Threading Lock Nut

A SELF-THREADING lock nut, which cuts its own threads on die-cast or cold-forged studs of nameplates, medallions, emblems, moldings, etc., has been announced by The Palnut Co.

Made of spring-tempered steel, comprising a thread-cutting lock nut and flat washer in one piece, in sizes for 1/8″, 3/16″ and 1/4″ unthreaded studs, the nut is hex form which fits all standard tools and shanks. It cuts deep, clean threads having high torque and tensile values and may be removed and re-used on the same studs. The resilient washer base assures full 360° contact on flat or irregular surfaces, and on perpendicular or off-angle studs.—For complete data, *Check New Product* 169.



New self-threading lock nut.

Impedance Bridge Assembly

A NEW UNIVERSAL impedance bridge assembly, Model 291, complete with ac and dc generator and detector units, has been announced by Electro-Measurements, Inc.

The instrument is contained in an attractive portable carrying unit. When closed, the instrument, including all panel controls, test leads and accessories, is completely protected. The bridge may also be mounted in a standard 19-inch relay rack.

For dc measurements of resistance and conductance, the built-in dc generator, operated from a 115 volt, 50-60 cycle ac power line, can provide either 10 volts or 300 volts to the bridge. During the balancing operation, bridge nulls are detected on a light beam type galvanometer having a deflection sensitivity of 30 millimeters per microampere.

An adjustable 0 to 15 volt power supply, operable from 100 cycles through 10 kilocycles, is available for ac impedance measurements. Frequency selections are made by means of plug-in networks. Visual detection of bridge balance is provided for by use of a dual electronic ray indicator having instantaneous response to a wide range of signal changes. Terminals are provided for accommodating other types of detectors when desired. Ample gain allows null indicator sensitivity to 20 microvolts or less.

The operating ranges and accuracies for this bridge have been improved. They are now 0.1 milliohms to 1.2 megohms, accurate to ±(0.1%); 0.1 micromicromhos to 1.2 mhos, accurate to ±(0.1%); 0.1

BUYERS' GUIDE

ADVERTISING. Directories — *General Telephone Directory Co., 1800 Busse Highway, Des Plaines, Ill.*—[ADV. 1]

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*—[ADV. 2]

BOOTHS—Acoustic Telephones — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*—[ADV. 3]

BORING MACHINES, EARTH — *Highway Trailer Co., Edgerton, Wis.*—[ADV. 4]

CORDS, Switchboard (with or without plugs), Instrument (retractable and regular) and Operators — *Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.*—[ADV. 5]

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*—[ADV. 6]

PIPE PUSHERS — *Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.*—[ADV. 7]

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 217 E. Main St., Spartanburgh, S. C.*—[ADV. 8]

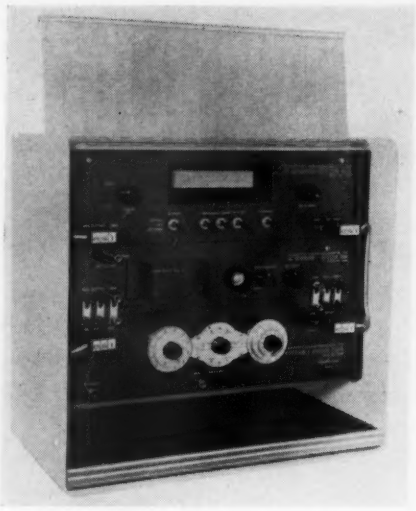
POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*—[ADV. 9]

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.*—[ADV. 10]—

REBUILT TELEPHONES & SWITCHBOARDS — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*—[ADV. 11]

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., New Brunswick, N. J.*—[ADV. 12]

WIRE, Insulated Drop and Bronze of Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*—[ADV. 13]



Impedance Bridge Assembly

micromicrofarad to 1200 microfarads, accurate to ±(0.2%); and 0.1 microhenry to 1200 henrys, accurate to ±(0.3%). The high precision possible with this bridge is achieved through the use of ESI close tolerance, wire wound resistors and the exclusive "Dekastat" rheostat. The main LRC dial has a scale with 11,000 effective graduations spaced approximately 1 millimeter apart.—For complete data, *Check New Product* 170.

Truck Crane

TRUCK CRANE, INC., now operating as a subsidiary of Anthony Co., has announced production of new truck mounted cranes.

Requiring only 18" of space behind the truck or tractor cab, the Truck-Crane unit leaves the entire body free for useful payload area.

Power for the Truck-Crane is completely hydraulic in all phases of operation with a PTO driven pump. Boom swing is 280°. It projects or retracts hydraulically in horizontal position or at any point up to an 85° elevation.

Both horizontal and elevating-type booms are available and offer speed, versatility and increased capacity to loading and unloading operations. Capacity is 5,000 pounds. Control levers are on both sides of the truck for operation from ground level. One lever provides forward, reverse, locking and speed control for each power movement. The valve bank, which locks automatically when levers are released, has a relief valve for prevention of overloading and subsequent damage of equipment.

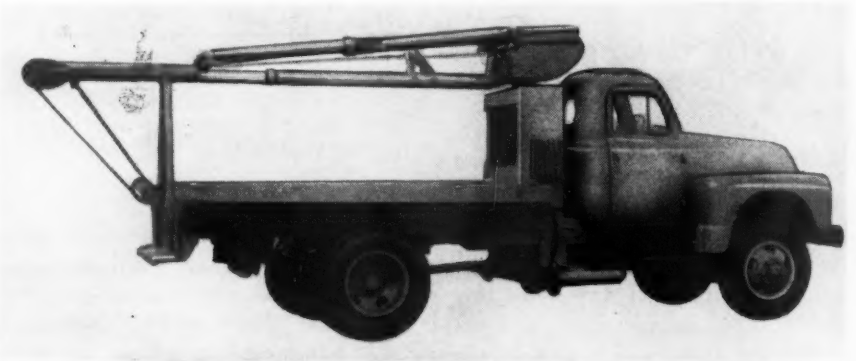
The high pivot point of the boom on the mast permits high loading right up against the crane superstructure. Boom "topping" capacity is equal to winch load line capacity. Stability is provided by standard hydraulic outriggers. For complete information regarding Truck-Crane units, *Check New Product* 171.

Polyester Web Tape

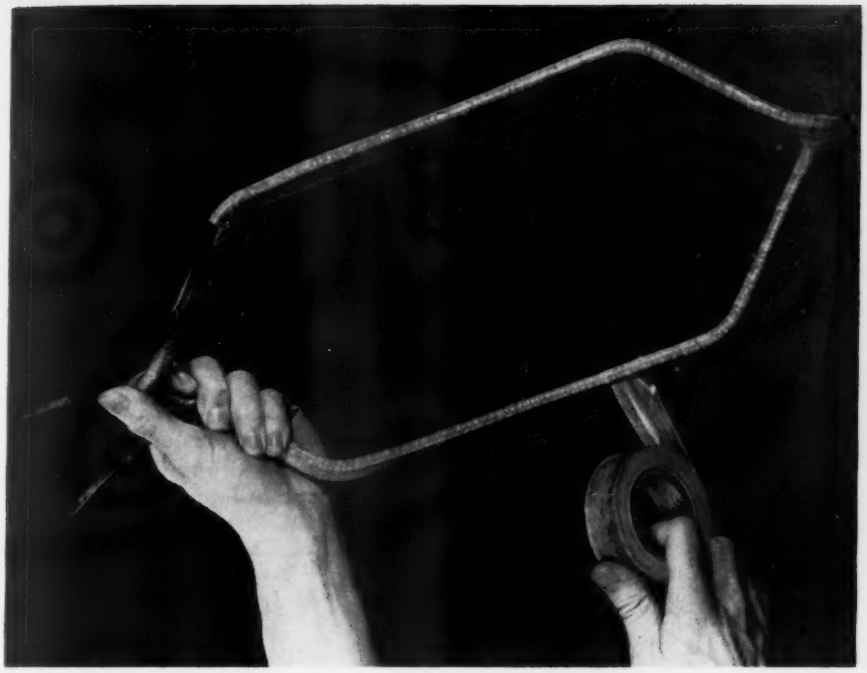
A NEW, VARNISHED. polyester web tape said to have a higher dielectric strength, a lower power factor, lower moisture absorption and greater conformability than other varnished insulations has been announced by Irvington Division, Minnesota Mining & Manufacturing Co.

Called Irvington brand "Fibremat" varnished polyester web tape, the new tape is rated as a Class A insulation material. It is expected to be used in such applications as wrapping field coils, phase insulation in electric motors, insulating generators and transformers and for cable insulation and splicing by utilities as well as other uses.

General properties of the tape include a dielectric strength of 1650 volts per mil, an elongation of 20 per cent, a water absorption rate of 0.5 per cent after 24-hours immersion and a power factor of 0.02. General resistance to water, salt water, acid and alkalies is described as ex-



TRUCK CRANE Model E-5-G with top-mounted winch.



"FIBREMAT" varnished polyester web can be made to conform smoothly to such hard-to-wrap units as knuckles on preformed coils due to it ability to elongate without rupturing the varnish coating.

cellent by the manufacturer.

One of the most important properties of the new tape, according to Irvington, is its extreme conformability in comparison with other forms of coated insulation. Due to the ease of elongation of the polyester web base, the tape can easily be pulled down tightly while wrapping to eliminate air pockets or voids and make a neater appearing unit. The elongation of the tape has no marked effect upon its dielectric properties and it can be stretched with a minimum of effort to conform snugly to irregular surfaces. This ability to deform only at the point of pressure is the result of the non-continuous fiber-base. The same property improves "Fibremat's" tear resistance.

Because of the easy workability of the tape, workers have found they can apply it faster and prefer its handling qualities. The conformability of the tape has allowed some manufacturers to increase by approximately one-third the dielectric strength of their insulation without increasing the over-all dimensions.

The new tape differs from woven fabric tapes in that it is made up of a mat of non-woven polyester fibers in a felted form which is impregnated with a varnish coating. The polyester base provides a material which can be easily stretched without losing its electrical properties.

Because the fibers run in a random pattern within the tape without any weaving, "Fibremat" can be elongated without the coating rupture common to stretched woven bases. A special varnish with improved linear characteristics contributes to the conformability of "Fibremat."

Since the polyester base is virtually moisture-proof, wicking of moisture common to many base fabrics is effectively solved in "Fibremat."

The new "Fibremat" tape is available in 7 and 10 mil calipers in either black or yellow varnish. Tape widths range from 3/8-inch to 2-inches in 36 yard rolls.

Further information may be obtained by *Checking New Product* 173.

CONCRETE DRILLING MACHINE—Beaver Products Inc., has announced the development and introduction of a new portable, concrete drilling machine for drilling holes in reinforced concrete, brick tile, marble, granite, and asphalt, or any hard masonry material. "The Eager Beaver" drilling machine will drill clean holes up to four inches in diameter and up to 18 inches or more in depth at the cutting rate of up to two inches per minute. This machine will drill either horizontally or vertically and is powered by merely plugging into any 110 volt electric circuit.—For complete data, *Check New Product* 172.

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THE CLEARING HOUSE

Published in each issue of Telephone Engineer & Management. Advertising forms close on 1st & 15th of month. Rates 15 cents a word except for Situation Wanted ads, which are only 10 cents per word. In figuring cost of ads, count each word of address in number of words used. All ads payable in advance. Minimum charge—$2.00. Special rates for display ads on request. Send copy and box number replies to Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Ill.

HELP WANTED

PLANT ENGINEERS — For large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, New York.

CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

WANTED: Man with two or more years experience in Traffic Department to develop as an assistant to Traffic Superintendent. Some technical knowledge of central office equipment desirable but not essential. Large telephone company in the southwest. Good wages and working conditions with employe benefits. For interview write, Box 9069, c/o Telephone Engineer Publishing Corporation, 7720 North Sheridan Rd., Chicago, Illinois.

WANTED: Telephone Installers, Installer Repairmen. State experience in application to W. C. Murphy, Superintendent, Southern Nevada Telephone Company, Las Vegas, Nevada.

SITUATION WANTED

SUPERVISORY ENGINEERING POSITION with progressive Independent Telephone Company. Age 32, 4 years experience all phases of General Plant Engineering, references. For details reply Box 9071, Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Ill.

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FOR SALE: 4 Positions, Kellogg #3 Toll Board, equipped with 30 toll line, 60 Rural and 1100 (Local line multipled to toll) 10 cord ckts. per position, equipped for toll dialing 5 party keys and collect and return keys, calculagraph wells and operator's chairs, also 6 positions Kellogg common battery switchboard, 15 cord ckts. each, automatic listening, line lamp recall, 1100 lines installed, universal cord ckt. on 3 positions, power panel, meters, charger, ringing machine, line and cut off relays, chief operator's desk, wire-chief desk, interrupters etc. positions can be split up. — Tipton Telephone Company, Inc., Tipton, Indiana.

FOR SALE

WESTERN ELECTRIC NO. 392 LOUD BELLS
Refinished and tested, with condenser — $6.00 each.
Telephone Equipment, Inc., Montrose, Mich.

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TYPE "C" HANDSET WALL MAGNETO TELEPHONES

5 Bar 1600 or 2500 ohm
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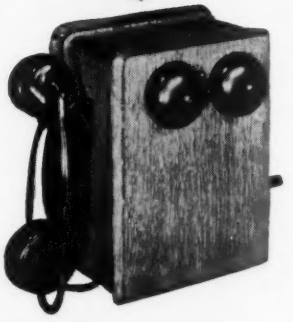
Black Lacquer Finish Unless Oak is specified.



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11 Pr. 22 Ga. SWP (Jute, Steel Tape) — 3200′, 3540′
11 Pr. 22 Ga. SWP — 1153′, 1435′, 1600′, 3000′, 3710′, 3750′
16 Pr. 22 Ga. SWP & DWP — 71′, 2000′, 2590′
16 Pr. 19 Ga. SWP & DWP — 200′, 263′, 795′, 834′, 2910′, 2934′, 2962′, 14 x 4500′
26 Pr. 24 Ga. SWP — 225′, 387′, 2 x 700′, 863′, 996′, 2370′, 7 x 4200′
26 Pr. 22 Ga. SWP — 267′, 500′, 700′, 1645′, 4400′
26 Pr. 19 Ga. SWP (Jute, Steel Tape) — 585′
51 Pr. 24 Ga. SWP 875′, 3025′, 5 x 4200′
51 Pr. 24 Ga. SWP (Jute, Steel Tape) — 250′
51 Pr. 22 Ga. SWP — 625′, 1088′, 1200′
51 Pr. 19 Ga. SWP — 600′
51 Pr. 19 Ga. SWP (Jute, Steel Tape) — 2370′
101 Pr. 26 Ga. SWP & Pulp — 575′, 2 x 3000′
101 Pr. 24 Ga. SWP — 350′, 1045′, 1585′
101 Pr. 24 Ga. SWP (Jute only) — 400′, 500′
101 Pr. 22 Ga. SWP — 75′, 2 x 600′, 796′, 8 x 3100′
152 Pr. 24 Ga. SWP — 2 x 2000′
202 Pr. 24 Ga. SWP — 180′ 250′, 300′, 1750′, 2100′
202 Pr. 22 Ga. SWP 47′, 510′, 700′, 935′, 5 x 1600′
404 Pr. 24 Ga. SWP — 1245′
404 Pr. 22 Ga. SWP — 1207′, 1400′
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606 Pr. 24 Ga. SWP — 634′
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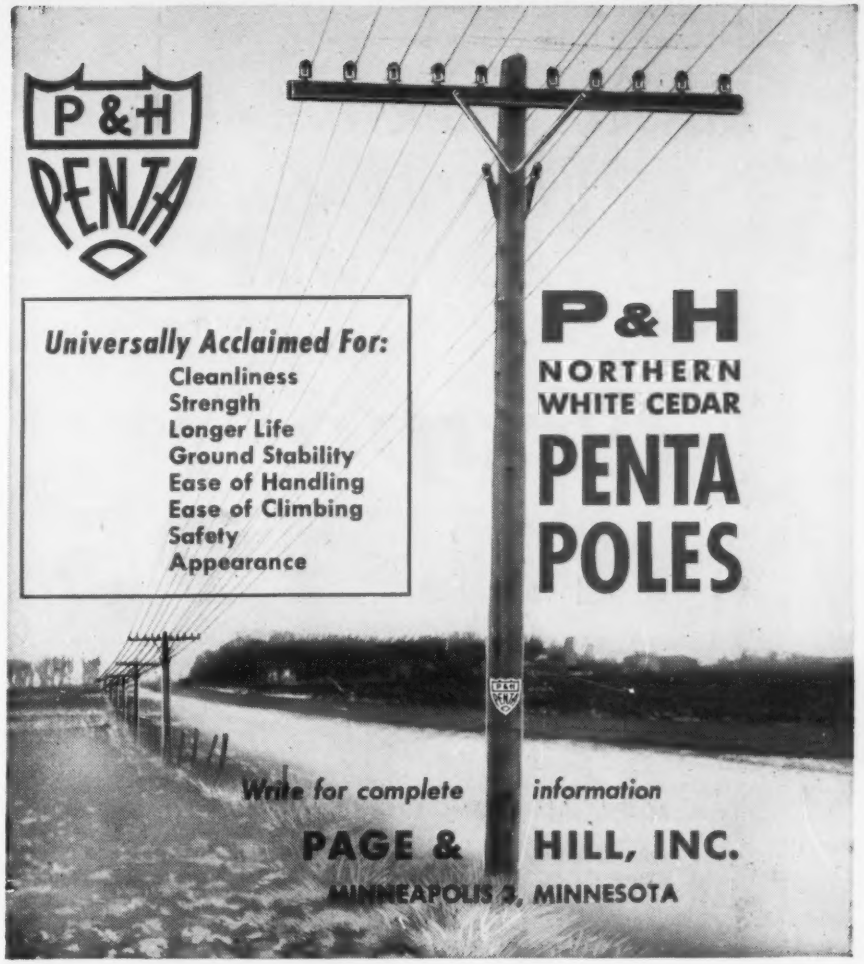


Three New Colored Telephones Offered By Automatic Electric

AUTOMATIC ELECTRIC CO. has announced plans to market three new colored telephones which extensive surveys have indicated are most desired by the nation's homemakers. The new shades are Gardenia White, Camellia Pink and Forget-Me-Not Blue.

Automatic Electric, which began manufacturing colored telephones in 1929, already offers seven colors in addition to the three new shades. They are, Classic Ivory, Sand Beige, Turquoise, Garnet Red, Sunlight Yellow, Jade Green and Dawn Grey.

Company officials say they expect the introduction of the new shades to substantially increase the demand for colored telephones.

Women, says the company, dictated which new shades should be added to the line. Merchandising surveys indicated that the nation's homemakers very much wanted the new delicate shades. A large percentage of women voiced a desire for Gardenia White telephones to blend with the decor of many of today's modern kitchens, laundry rooms and bathrooms.

Camellia Pink and Forget-Me-Not Blue are preferred by many women for boudoirs, dressing rooms, nurseries and wherever the connotation of femininity and luxury are desired.

Free Literature

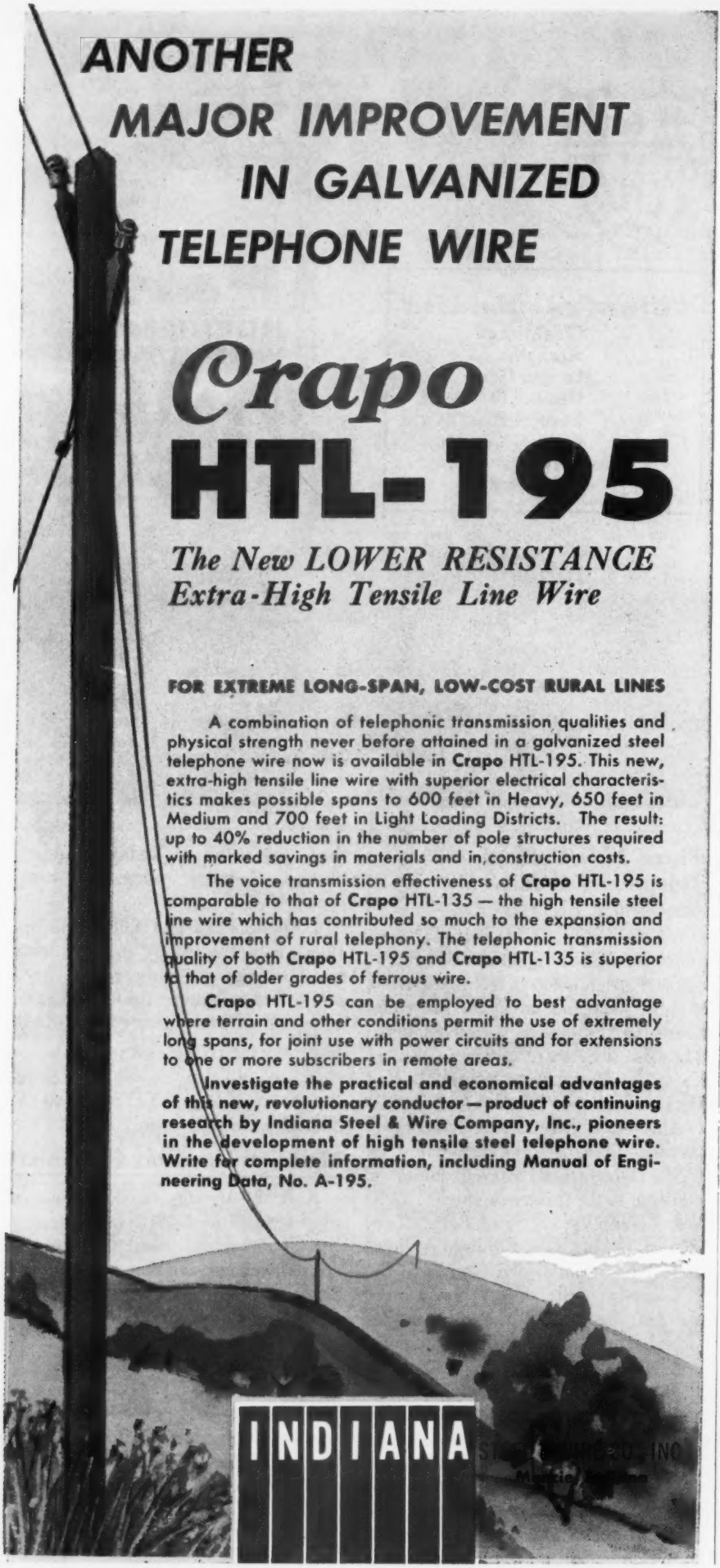
(To obtain your copies write Readers' Service Dept., TE&M, 7720 N. Sheridan Rd., Chicago 26, Ill.)

Materials Handling Containers

A NEW 16-page catalog designed to describe the company's complete line of materials handling containers constructed of Diamond vulcanized fibre has been announced by Continental-Diamond Fibre Corp.

Hand Stoning

AN ILLUSTRATED handbook on hand stoning tells how better finishes can be obtained and cutting tool life increased with the proper abrasive stone. The booklet, issued by Behr-Manning Co., lists and describes the scores of special shapes, types and sizes available.


ANOTHER
MAJOR IMPROVEMENT
IN GALVANIZED
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HTL-195
The New LOWER RESISTANCE
Extra-High Tensile Line Wire
FOR EXTREME LONG-SPAN, LOW-COST RURAL LINES
A combination of telephonic transmission qualities and physical strength never before attained in a galvanized steel telephone wire now is available in Crapo HTL-195. This new, extra-high tensile line wire with superior electrical characteristics makes possible spans to 600 feet in Heavy, 650 feet in Medium and 700 feet in Light Loading Districts. The result: up to 40% reduction in the number of pole structures required with marked savings in materials and in construction costs.
The voice transmission effectiveness of Crapo HTL-195 is comparable to that of Crapo HTL-135 — the high tensile steel line wire which has contributed so much to the expansion and improvement of rural telephony. The telephonic transmission quality of both Crapo HTL-195 and Crapo HTL-135 is superior to that of older grades of ferrous wire.
Crapo HTL-195 can be employed to best advantage where terrain and other conditions permit the use of extremely long spans, for joint use with power circuits and for extensions to one or more subscribers in remote areas.
Investigate the practical and economical advantages of this new, revolutionary conductor — product of continuing research by Indiana Steel & Wire Company, Inc., pioneers in the development of high tensile steel telephone wire. Write for complete information, including Manual of Engineering Data, No. A-195.
INDIANA

(Concluded from page 80)

of Pennsylvania and coordinate these activities in all departments of the company. Need for this new function has been created by the intensive growth experienced by General Telephone Co. of Pennsylvania.

At the end of World War II, in 1945, the company had in service somewhat more than 82,000 telephones. Today, that number has increased to a little over 190,000 — more than double the total of 1945. This growth has called for very substantial expansion and building programs and capital expenditures that have increased the Company's investment in plant from about 15 million dollars in 1945 to its present day total of over 50 million dollars.

Along with this important growth, there is today a growing market for special services, such as telephones for the hard-of-hearing, loud speaking telephones, color telephones, illuminated dial sets and automatic answering devices.

As merchandising manager, Cunningham will initiate and develop plans and recommend policies for the company that will effectively utilize merchandising techniques so customers will receive greatest benefits from modern telephone service and, at the same time, produce maximum revenues to the company on its ever increasing capital investment.

STAHL METAL Products, Cleveland, has announced the appointment of RONALD E. HULL to the position of vice-president in charge of sales. Mr. Hull joined Stahl, builders of utility truck bodies, approximately one year ago, as general sales manager after long experience in the utility body field.

STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

News and views of Independent telephone people. VOLUME 6, NO. 4 • JULY, 1957

Lincoln Company finds that

One Subscriber Sells Another

Miss Betty Kaloze, receptionist, installment loan department of the First National Bank, Lincoln, enjoys the convenience of the 6K Telephone.

She can tell at a glance the origin of calls and, if necessary, hold an incoming call while she originates another call by dialing.

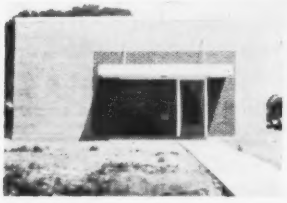
The Lincoln Telephone and Telegraph Company enjoys an enviable reputation for leadership in commercial service. Mr. Kenneth L. Lawson, General Commercial Superintendent; Mr. William D. Quinn, Sales and Merchandising Supervisor; and Mr. Alex Geist, Commercial Engineer, compose the "team" largely responsible for the program which has kept subscribers in the vast Lincoln network enthusiastic in their praise of the service.

There is no special formula for their success. The 150 6K Systems in service in the cities of Lincoln, Hastings, Beatrice, Fairbury, Plattsmouth, Seward and Nebraska City were sold because they best fitted the need for small trunk-connected switching systems appropriate to the type of business they serve. Once the first sale is made, the subscribers sell each other. Users are particularly enthusiastic about dial-selective switching and the "executive-right-of-way" feature. And they appreciate the styling in modern office gray.

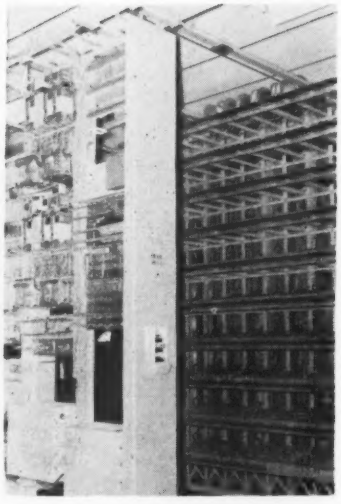
Other features appreciated by the Lincoln Company's customers — you'll find these subscribers in organizations such as banks, small loan companies, clinics and drug stores — include the fact that if several trunk calls come in, they can be taken care of immediately. With the 6K System, one secretary can handle all incoming calls and tell visually the origin of calls and where they are being used.

There's no better salesman than a satisfied customer.

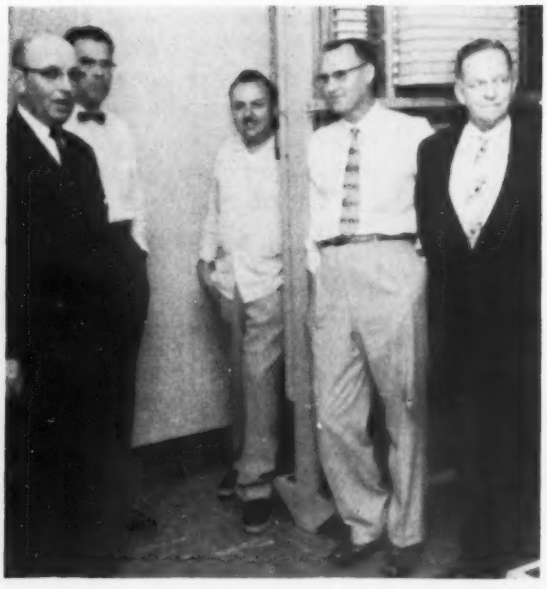
Division Maintenance Supervisor Paul Robertson of Southwestern States stands amidst new dial equipment after giving signal to cut new Rusk exchange into immediate service.



Southwestern States Te
Converts Mamou, La



Cutover at Mamou, Louisiana, (picture at right) was successfully completed after months of work installing new dial equipment and miles of wire. A few days later and 200 miles away, Rusk, Texas is also converted to dial (picture below). L. to R.: M. E. Barnes, Plant Superintendent; J. Lancaster, Brownwood; J. Canone, Stromberg-Carlson Installation Foreman; D. Gorman, Equipment Supervisor and J. Witt, Southwestern States.



Cutovers to XY Dial operation for Southwestern States Telephone Company exchanges have been coming at a rapid rate; sometimes they almost overlap.

For example, the cutover at Mamou, Louisiana, was followed only a few days later, but over 200 miles away, by the conversion at Rusk, Texas.

From a small exchange with twelve subscribers only thirteen years ago, the Louisiana community of Mamou, just south of Alexandria, has grown far beyond expectation, so that there are now over 700 listings in the local exchange.

The opening of the new dial office climaxed an expansion program which included construction of a new building, complete modernization of outside plant, and the installation of a dial system designed to serve not only Mamou but the adjacent communities of Reddell, Pine Point, Johnson Cove, Beauregard, and Reedton.

Present at this cutover were many local civic leaders as well as Southwestern States Company officials including E. Barnes, General Plant Superintendent; J. Lancaster, Equipment Instructor, and R. L. Post, Public Relations Director, all from the Brownwood, Texas headquarters. Present also were J. M. Nelson, Divi-

Mr. H. E. Reeves, Division Manager in Henderson, Texas, for the Southwestern States Telephone Company, explains to fascinated guests the efficient operations of XY Dial at the Rusk cutover.

es Telephone Company
Land Rusk, Texas, to XY

sion Manager, J. E. Knighton and S. T. Sanders, from Welsh, Louisiana, which previously joined the group of Southwestern States exchanges already converted to XY Dial.

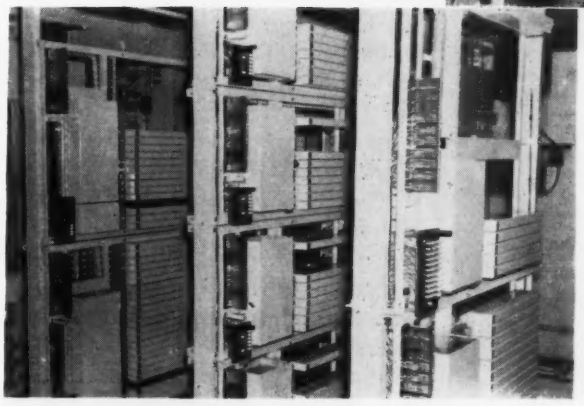
Shortly after the successful conversion at Mamou, residents of Rusk, Texas, started to use their new dial equipment, placed in service after months of study, engineering, planning and hard work.

The 650 line, 1100 terminal equipment is housed in an exchange building of a contemporary style now becoming standard with this company. The office will be open soon for public inspection.

The actual cutover was preceded by a Dial Dinner attended by fifty persons including local civic leaders.

Present at the conversion later were H. E. Reeves, Division Manager, and Paul Robertson, Division Maintenance Supervisor, of Henderson, Texas; Donald German, Equipment Supervisor; M. E. Barnes, J. Lancaster, and James Witt, all from Brownwood, Texas; Jim Canone, installation foreman, and Carl Price, both of Stromberg-Carlson.

The Mamou and Rusk conversions bring closer the day when all the vast Southwestern States Telephone Company system will be dial operated — proof positive of their faith in the future of their own Southwest.



Everybody got into the act at cutover time (above) in Rusk, Texas; while equipment at Mamou (left) had been at work for days.

Gulf States Displays at Commerce, Texas

We received a letter and the picture at the right the other day, from Mr. Roi H. Cornish, local manager at Commerce, Texas. It made us feel good to learn that the display, presented as a part of Industrial Display Week in Commerce, was "received by the public most enthusiastically" and resulted in the immediate sale of several Koiled Kords, an Antique Ivory 1543 Series colored telephone and an order for more, plus the expected sale of Hands-Free Telephones as well as Two-Line 1573 Series Telephones. Other equipment on display included the XY Universal Switch, XY Toll Recorder, the Gai-Phone and the 6K-1 Telephone. We're certainly pleased that the cooperation between the Commerce Exchange and Stromberg-Carlson proved successful for all concerned.

New Line Routiner Runs by Itself

Some months ago the need arose for an improved type of Line Routiner, applicable to various types of step-by-step systems, that would be capable of working with the new test trains being furnished in many of the dial offices now being installed. An investigation was made to determine what features would be desirable for this new line routiner. The answers were very obvious; the unit should be:

1) *a fully automatic device, including remote start.*

2) *usable in any step-type dial office.*

3) *of as high a speed as possible.*

4) *of maximum accuracy, and self checking.*

5) *capable of being "proved-in" for small offices.*

The investigation further indicated that there was no line routiner available at that time combining all these features. Consequently the project, a dual effort on the part of the author and D. T. Robb, (who has recently been promoted to new responsibilities in the Electronics Division) was initiated, which led to the Stromberg-Carlson Line Routiner.

Earlier types of routiners had drawbacks

The purpose and function of a line routiner is generally understood — a means of stepping a test train consisting of a test selector and a test connector successively to each connector terminal in the office, and from there to test the outside cable for:

1) *leakage resistance between the tip and ring conductors,*

2) *leakage from tip or ring to ground,*

3) *the presence of a "foreign" potential.*

The conventional routiner provides a means for determining a faulty line terminal number by displaying it on four sets of ten lamps each, representing the thousands, hundreds, tens and unit digits of the line exhibiting the fault. The conventional unit normally seizes and tests from 700-1000 lines in an hour *if* no faults were encountered. Whenever a fault was found on a line, the routiner would stop and sound a buzzer alarm, at the same time displaying the line number through the line lamps. Simultaneously an additional group of three lamps would identify the type of fault: foreign potential, ground, or loop. The test man would be interrupted to jot down the line number, switch the connection over to the test desk for further tests on the line if desired; only after releasing this connection or operating a restart key could the routiner continue testing other lines.

This has meant that routining could only be done when a test man could be present, and the interruptions following a fault detection would greatly limit the type of work he could perform while the routining was progressing. This in itself is wasteful of highly skilled talent.

Of equal importance with efficient use of manpower is the desirability of carrying on this routining during the hours between midnight and sunrise when the cables cool off and moist air is drawn into any openings in the cable. This was not practicable with previous types of line routiners.

New routiner quickly pays for itself

The new line routiner follows the present day trend to automation in that the unit, once started, needs no attention whatsoever; provides a *permanent printed record* of all line faults found in testing out the office, available to test and maintenance personnel whenever they want it. Following this pattern of completely unattended operation a step further, the unit may be started remotely, as will be described in more detail under circuit analysis. The accumulated savings in man-hours achieved by these automatic features means that the unit will pay for itself in a comparatively short time *even in small* dial offices, especially as it is arranged to test any number of remote offices regardless of type of step-by-step switching equipment.

Design and component parts

The routiner circuit and the printer control circuit are contained in an attractively styled cabinet available in gray, mahogany or limed oak with a black laminated front panel. The overall cabinet dimensions are approximately 30″ (length) x 20″ (height) x 18″ (depth). The printer itself, in size and appearance, resembles a conventional adding machine. The DC power supply, required for the printer and the AC control circuit are generally mounted on the power board. Test selector trunks, giving the routiner access to the test trains — be they local or remote — are mounted external to the routiner. The routiner unit is completely independent of the test desk and can be placed in any desired location.

The capacity of the standard routiner is six offices, which may be tested at a rate of 1400 lines per hour in offices having capacitor-coupled ringers and 2200 lines per hour in offices having tube type ringers. More than six offices may be routined if additional keys and relays are mounted external to the routiner.

Physically the unit consists of five principal components:

1) *A pulse generator produces the impulses required to drive the test train; bounce-free, hermetically sealed mercury contact relays provide an extremely stable pulse source over the full range of office voltage.*

2) *A register unit, consisting of four XY Deca switches, "remembers" the thousands, hundreds, ten and units digits of the line being tested in case a fault shows up.*

3) *A scanning device, also consisting of an XY Deca switch, which scans the other four deca switches to determine the next number to be dialed.*

4) *The test circuit — a magnetic amplifier providing stability with minimum response time.*

5) *The printer and its associated control circuit, which scans the test sequence control relays to determine and print the type of fault which may have been found.*

Operation

To provide flexibility of use, the

line routiner may be arranged on a per office basis as selected by one of the six office keys to provide varying features. This furnishes access to:

1) *four digit test train,*
2) *three digit test train, or*
3) *test train in a mixed terminal-per-line and terminal-per-station office requiring cancellation of the hundreds digit in certain thousands groups only.*

In encountering a line fault, the printer control circuit scans: first, the office selection circuit to determine which office is being tested; then the sequence relays in the line testing unit to determine the type of fault found; and thirdly, scans the position of the line number registering deca switches to obtain the connector terminal number on which the fault is found. At this time a six digit entry is automatically made on the adding machine tape. The first digit is an arbitrarily-chosen digit corresponding to the office being routined. The second digit designates the type of fault found. The remaining four digits record the line number.

Testing the tester

One might ask the question: how do you determine if the line routiner is functioning properly, especially since it is automatic? Stromberg-Carlson has included the answer in the design. The test may be completed if one connector terminal in a local office is available. The number of this terminal may be strapped on the digit-registering XY Deca switches of the routiner. When the routiner reaches this terminal, it will connect a known resistance, via the test train and the connector bank terminal, back into the testing circuit. Tests are applied to insure the line testing circuit is in proper calibration.

Special fault code digits are printed as the test is made. If the test train does not reach the proper connector terminal, the fault code digit printed will be a four; if the test train reaches this terminal and finds the testing unit out of calibration, the number five will be printed. A fault code digit of zero indicates proper performance.

The line testing device, though it may be small, is the heart of any automatic line routiner and its sole reason for existence. Accuracy, speed of response and, above all, stability during repetitive operations are essential. Use of a relay for line testing introduces inaccuracies, especially on repetitive operation, as the operate or release point of even a sensitive relay will shift from one moment to the next, due to the hysterisis loop.

Circuit features

It was decided, therefore, to investigate the use of a magnetic amplifier for the test device. Extensive tests proved the wisdom of this move, and led to incorporating the amplifier unit in the final design.

The input or control winding of this amplifier forms the balance detector portion of a wheatstone bridge, one leg of which is the line on test. As the center arm of the bridge, the amplifier naturally becomes independent of office voltage fluctuations. The polarity of the current through the amplifier's input winding determines the amplifier's output: indicating whether a line is good or bad.

If the line routiner is set to check for 50,000 ohms, for example, any line having an appreciably higher or lower resistance will cause a fast response of the amplifier. A line leakage resistance close to 50,000 ohms would require a slightly longer response time. Thus the speed of the answer by the amplifier depends solely on the condition of the line and not upon an external constant-speed source, which, in other units, drives the relays required to switch the circuit through the various tests. Independence of an external driving source permits the great increase in testing speed of the new line routiner by Stromberg-Carlson.

The new (Stromberg-Carlson) line routiner is concerned not only with speed but also range and accuracy. The routiner uses the familiar selector switch on which the test value up to 100,000 ohms may be set in steps of 10,000 ohms. Accuracy of the line test device varies from 0.4% when testing at 10,000 ohms, to 1% when testing at 100,000 ohms. Such accuracy can be approached by no other testing device of similar simplicity.

Four means of remote starting

In addition to providing a fully automatic unit, Stromberg-Carlson has also furnished four means of remote starting:

1) *By keys at the toll board or any other convenient location.*

2) *By a time clock or humidity-detecting device which may start the routiner at the best time between midnight and sunrise.*

3) *By a selector level, if available. This starting circuit contains an XY Deca switch into which a digit may be dialed to select the office to be tested. The circuit is so arranged that if subscribers have access to the selector level, certain safeguards are provided to minimize the possibility of accidentally starting the line routiner.*

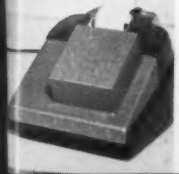
4) *By dialing a connector terminal.*

To avoid accidental starting of the routiner when a subscriber dials a wrong number, interlock arrangements are provided, making it virtually impossible to start the line routiner.

In this automatic line routiner, Stromberg-Carlson has been first to provide a compact device capable of being used with any type of step-by-step switching equipment.

Unattended operation, including remote start, means a saving in labor costs, since tests may be run at night. Performance of routine maintenance duties are not disturbed. Yet, a permanent printed record of outside plant conditions is obtained. The routiner's speed of operation allows full office routines to be completed during early morning hours and does not tie up the test train for excessive periods. A self-checking device, the Stromberg-Carlson line routiner has greatly increased reliability in the efficient identification of faulty line terminals in dial offices.

The introduction of this unit once again demonstrates the forward steps taken by Stromberg-Carlson in presenting needed devices of advanced design to the telephone industry.



Front view of standard line routiner in dial central office shows lamps for indicating line routiner performance and keys for control of tests. Printing device at right prints permanent record of faults.

Bolivar, Missouri:

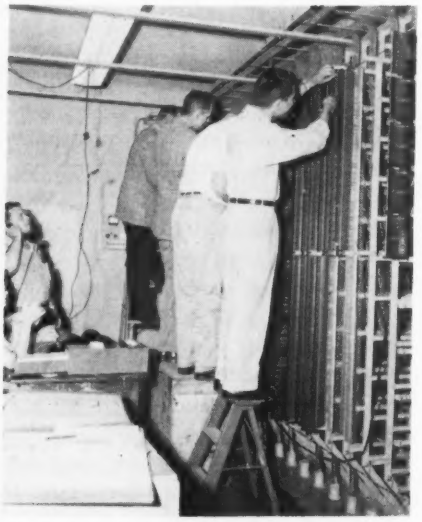
Center of Activity

Last call on old manual board now coming up before cutover begins at Bolivar, Missouri, exchange.

Bolivar, Missouri, just north of Springfield, has been a bustling center of activity in recent months to improve the surrounding area in at least two fields of endeavor.

The construction of a dam on the nearby Pomme de Terre River is underway to provide flood control, improvement of low-water flows, water supply and recreation. This is a project scheduled for completion in the not-too-distant future.

Another project, also once a "dream of the future," has been completed. Its impact has been felt not only in Bolivar, but also throughout the surrounding rural region. For the first time in the history of the Bolivar Telephone Company, managed by Mr. Paul Drake, both rural and city subscribers are being served by one telephone system: XY Dial.



Short ladders, tall ladders, boxes; we'll stand on anything available to convert to XY Dial.

The recent conversion of the 750 line, 1500 terminal exchange brought immediate dial service to present subscribers and also prepared the local company for future expansion as the needs of the community for dependable dial service match the increasing importance of the area.

The new building housing the dial equipment and business office, features a drive-in service for extra convenience in paying monthly statements. A speaker has been installed for conversing with the attendant inside.

In picture above Manager Paul Drake (right) examines power board of new dial system as Fred Harkins (left) a retired telephone employe, Springfield, assists. Photo at left shows up-to-date exchange featuring drive-in window.

ColoR

ThrougRe

Have you ever tried rubbing the color off a Stromberg-Carlson telephone? Don't worry, it's in to stay, just as telephones in color are here to stay, if the current trend is any indication.

While the idea of color in telephone instruments is not new — sets were available in twelve lacquered colors in the late 20's — the acceptance of the idea as a practicality had to await the development of color-molding processes suited to the types of plastics employed.

Considerable thought, research and testing is behind every high-quality, color-fast Stromberg-Carlson telephone. Just as every part within the 1500-Series telephone is quality-made to perform virtually trouble-free, the plastic housing, handset and dial number plate, which take as much use (or even abuse) as the "working" parts, must still maintain their beauty and durability as well as utility.

Needed to fill these requirements was a plastic material containing the following properties: toughness, so that if dropped or used roughly, the molded parts would be resistant to breakage and protect the vital components inside; rigidity, allowing the plastic to be molded into a lightweight cross-section and still hold its original shape.

We've all seen colored plastic materials with a dull finish. Today's demands for colored telephones make it imperative that the finish be smooth, but the colors soft and harmonious. For that reason, the material to be selected must be available in colors to complement varied interior locations.

Ease of molding; retention of high luster through years of use; resistance to perspiration and cosmetics which would normally stain plastic; comfort at the touch when the handset is held (not like picking up a cold piece of metal) — these properties were needed in the plastic for producing quality telephones in color.

After much research and practical testing of available molding com-

olQuality Assured

ugResearch, Testing and Molding Processes

pounds, Tenite II — a thermoplastic — was selected as the material exhibiting the inherent properties to meet the rigid specifications set up by the Engineering and Materials Engineering Departments.

An HPM 12-16 ounce injection molding press was then purchased specifically for making high-quality housings in eight exciting colors plus ebony.

With the first problem (that of determining the material to be used in making colored parts) solved, other problems followed on its heels. Adjustment of molding dies, pressures and temperatures within the machine, color matching parts, dust, contamination, breakdown of color pigment, "magnified" visible defects — all challenged engineering and production personnel.

David Cadwallader, Apparatus Engineering; Richard Mullen and Edward Swanson, Production Engineering, working closely with Edwin Palmer and Gene Smith, Materials Engineering, and Joseph Palumbo, Foreman of the Plastic Molding Department, arrived at solutions that have made Stromberg-Carlson colored telephones a highly desirable item.

By carefully adjusting the housing mold while keeping an eagle eye on correct pressures and temperatures, an even flow of Tenite II is assured.

Rigid control of temperatures and pressures is necessary to make certain that the color does not vary within an individual housing, or from one housing to another.

Another problem, that of contamination, is overcome by thoroughly cleaning all tubes before production begins on another color. By completely purging all tubes, no specks of dust or plastic from the previous run remain to spot the next color. Original Tenite II is always used; never reground rejects.

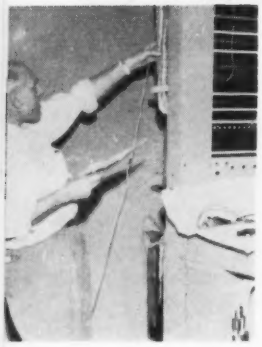
The temperature of molded parts when removed from the die is usually near 150°F. and may be easily marred during removal. To avoid this, a spray lubricant is applied to the chrome-plated die before each part is actually molded.

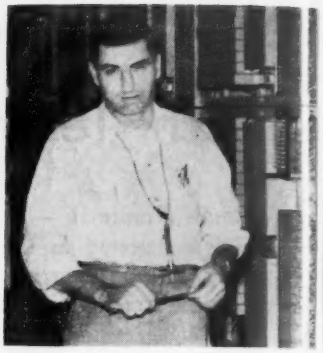
Laboratory tests by the manufacturer of Tenite II and color matching tests by the Materials Engineering and Inspection Departments at Stromberg-Carlson demonstrate the care taken to guarantee matching colors, not only from lot-to-lot, but also from part-to-part — i.e. between housing, handset and number plate.

Telephones in modern colors are here to stay. Their permanence, not only in customer preference, but also in color, luster and resistance to breakage has been assured by the close and continuing cooperation of Stromberg-Carlson engineers and veteran technicians.

Even now, as the problems of plastic molding in permanent colors appear to be solved, continuing study and laboratory experiments are keeping abreast of all advances in basic plastic materials so that when improvements can be positively proved, they will be adopted.

Continuous testing and research is the order of the day as (l. to r.) Gene Smith, Materials Engineering, checks temperatures controlling HPM injection molding machine. Joe Palumbo, Department Foreman and Edwin Palmer, Materials Engineering, examine newly-formed housing while Johanne Kretovic and May Riccardo place finishing touches on other housings.





M. J. Trenton, installer foreman (left photo) concentrates on new dial equipment. Above, (l to r) Chief Operator Emma Wildrick; Traffic Supervisor Hazel Couch; Roscoe Pontius, General Manager; Mr. Brubaker and, seated, Mr. C. C. Whitlock, Plant Superintendent. Mervin Wise, installer foreman, (right photo) now with sales department, Rochester, New York.

Coordination smooths the way for

Dial Conversion at Rochester, Indiana

Mr. Tully Pontius, father of Roscoe Pontius, begins actual cutover to XY Dial.

When a large exchange goes dial, and especially when it is tied in with the national Direct Distance Dialing network, there is always a big job of coordination. The group of men and women from the Rochester (Indiana) Telephone Company shown above have every reason to be proud of their accomplishment. Countless details, which could have proved troublesome, were anticipated and handled in joint responsibility under the overall direction of Roscoe Pontius, General Manager, and veteran of many years service in his community and his industry.

There was a unique feature to this cutover, in that it was planned to coincide with the conversion of an XY Dial exchange of similar size, owned and operated by another well-known Indiana Independent, and serving the nearby city of Tipton. Dial service in the two cities was inaugurated by the two mayors, mutually extending congratulations to the management of the respective telephone companies on behalf of their citizens.

Prior to the cutover at Rochester, a well-planned subscriber educational program was instituted and carried out largely under the direction of Mr. Hugh Barnhart, president of the telephone company and a leader in civic affairs.

The new system provides the latest type dial service for the 3,600 present subscribers and provides for easy expansion to meet even the most optimistic estimates of growth. A new eight-position toll board will handle outgoing long distance calls — at least for the present — as well as all the special services necessary in any large toll center. Normal incoming calls from any city now in the DDD network will be completed without operator assistance.

Mr. Pontius and the directors plan an open house during the summer after they have completed removal of the replaced equipment and remodeling the buildings.

Representing Stromberg-Carlson were (l to r) Ferril Paulk, installer; Colby Knapp, assistant sales manager; Mrs. Wise; Mervin Wise; Mrs. Trenton; R. E. Hoffman, sales engineer and M. J. Trenton.

Stromberg-Carlson
Transmitter
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STROMBERG-CARLSON
A DIVISION OF GENERAL DYNAMICS CORPORATION
Rochester 3, New York
GEORGE B. FORBES, Editor

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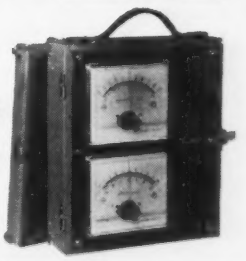

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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

"Name Trouble"

FROM past experience we well know that selecting that "just right" name for the new baby can be an exasperating job. But it appears the American job of name giving is simple compared to the dilemma found by parents in Bulgaria and Russia.

We draw this conclusion from a report that a Bulgarian newspaper has chided parents for giving children "ugly, absurd and even indecent first names," and backs up its claim by reporting girls are being named *Gramophone*, *Telephone* and *Cashier*. These come out *Gramophonka*, *Telephonka* and *Cassyerca* in Bulgarian.

Moscow papers also recently criticized parents for giving their children such "detestable names" as *Electrification*, *Combine* and *Detector*, names which are an outgrowth of the Communists' own propaganda.

"Dancing Lesson"

WE have heard motorists come up with some wild excuses after auto-pole collisions. But last month a Detroit driver came up with a new alibi when he was ticketed for reckless driving after his car struck the pole.

"I was just returning from a visit to a sick friend," the driver told the traffic court referee, "when that pole jumped in front of my car."

Asked what the other poles were doing, he said: "They were just dancing."

Winded

WE understand the wife of an advertising friend of ours went on vacation last month. Before leaving she extracted a somewhat reluctant promise from her husband that he would exercise her two dogs regularly every day. To perform this chore, he had to come home at noon which seriously interfered with his luncheon engagements.

Advertising men are paid for thinking up new ideas, so this executive put his mind to work to find a simpler solution. He noticed that when the telephone rang, the dogs raced madly about the house until it stopped ringing. Why not, he thought, exercise the dogs by remote control? Accordingly, he called his number each noon, waited 15 rings and hung up.

Everything worked out very nicely until a business associate, learning of this trick, secured a key to the apartment and dropped by at the appointed time to wait for the call. After 12 rings, he lifted the receiver, panted into the mouthpiece, and hung up.

This startling phenomenon so unnerved the executive that he returned hastily to his house and personally exercised the dogs.

Teen-Age Problem

NORTHWESTERN Bell tells the story of the parents who ordered a telephone installed in their teenager's bedroom.

She was touched by their thoughtfulness but continued to use the family phone as before. One night after she had called up a school friend and had talked happily and at random for over half an hour, the father rose to protest.

"Why," he inquired, "didn't she use her own phone?"

"Why," she explained in logical detail, "if I used my phone and someone tried to call me, the line would be busy."

Super Service

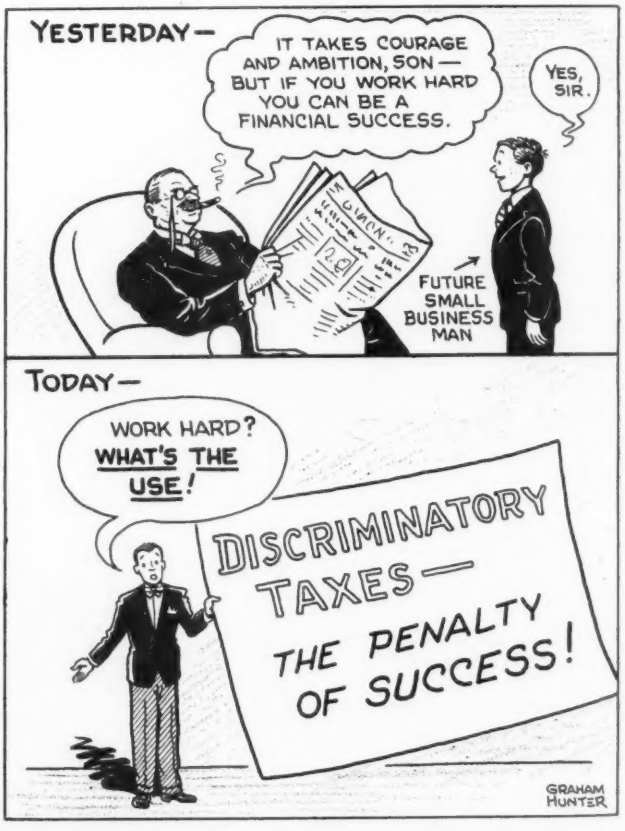
FROM TEXAS comes the yarn about a wealthy oil man who installed a color telephone on the dash of his flashy convertible. On the floor he placed a button by which he could make it ring.

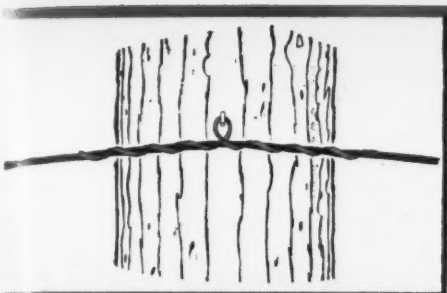
His fun resulted from pulling up alongside women drivers at traffic lights. The phone would ring loudly. Tex would pick it up and make a big show of answering:

"Hello. Yeah. Who? Okay, just a minute."

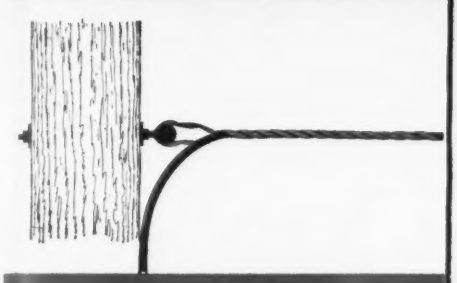
Then Tex would pick up the phone and hand it out the window, explaining: "It's for YOU, doll."

HOW TIMES HAVE CHANGED!

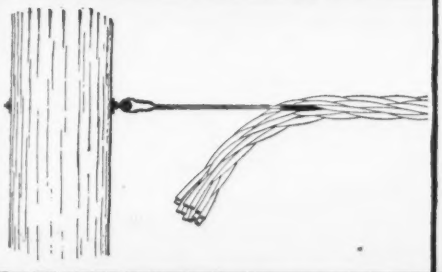

YESTERDAY—
IT TAKES COURAGE AND AMBITION, SON— BUT IF YOU WORK HARD YOU CAN BE A FINANCIAL SUCCESS.
YES, SIR.
FUTURE SMALL BUSINESS MAN
TODAY—
WORK HARD? WHAT'S THE USE!
DISCRIMINATORY TAXES— THE PENALTY OF SUCCESS!
GRAHAM HUNTER



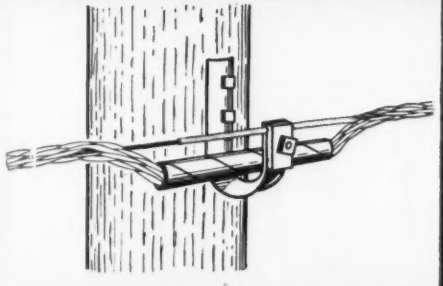
"C" Rural Tangent Supports



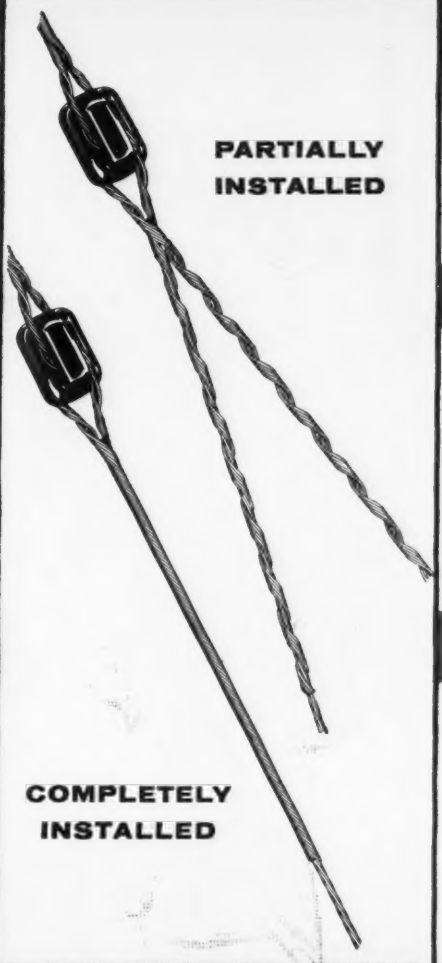
"C" Rural and Open-Wire Dead-Ends



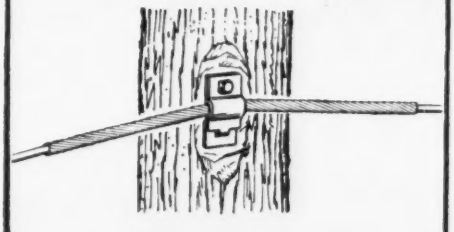
"B" Rural Dead-Ends



Armor Rods for Insulated Messenger

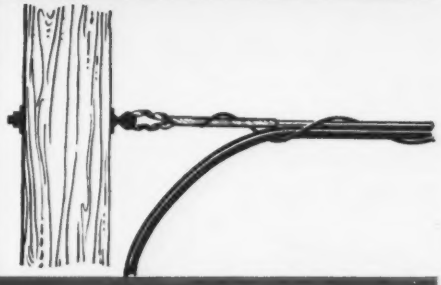


Guy-Grip Dead-Ends

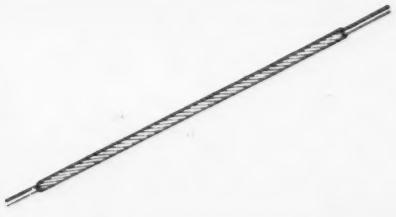


Line Guards

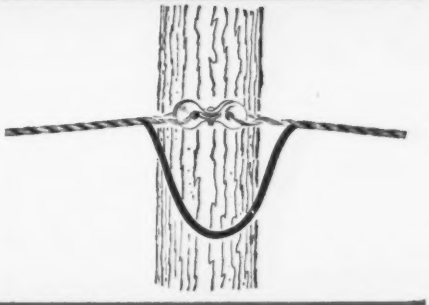
Drop Wire Dead-Ends



Lashing Rods



Splices for Line Wire and Messenger



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